

AMATEUR RADIO

MARCH 1963



Vol. 31, No. 3



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WI Broadcasts: VK5WBI: Sundays, 1100 hours EST, simultaneously on 3673 Kc., 7146 Kc., 50.15 Mc. and 145.13 Mc.; Intrastate call-backs taken on 3650 Kc. VHF 1320 hours EST on 50.15 Mc. and 145.13 Mc.; call-backs taken on 3 metres.

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OUR COVER

Looming high on a hill at Ballarat (Victoria) there are a series of aerial towers, between which are Sterba curtains, which imply the location of a commercial broadcaster; such is not the case. This most impressive array is the joint property of VK-3HW and VK5AMH.

In a later cover photo will be shown the equally impressive station set-up, which would rank with any Amateur station, irrespective of location.

FEDERAL COMMENT

★

PROGRESS OF YOUTH

For many generations as the world has progressed man as the more experienced being has taken an interest in youth, trying—and with great success—to provide for him the opportunities which man himself missed through circumstances either beyond his control or which he did not grasp when opportunity presented itself.

This success is evidenced by the younger age of men holding responsible positions in government, in industry, in the municipalities of large cities, in provincial towns, in commerce, in schools and universities, in science laboratories—in fact in every walk of life where man employs himself in the age-long toil for existence. Such success has not just "happened" but is the direct result of man's interest in youth, in passing on to the younger generation the knowledge and experience he himself has gained over a longer span of life.

As the world entered the technological era youth was first presented with known facts then left with unsolved problems. Gradually youth met the challenge of his forbears and took an interest in matters previously left to the older man. Educational standards rose until today youth has opportunities unthought of a mere few decades ago.

With the dawn of the space age greater and greater call is made upon youth to tackle the technical problems involved in a venture so gigantic that it is sometimes beyond the comprehension of older people. Radio, which itself was a miracle five decades ago, is being supplanted by technological progress undreamed about when radio was in its infancy. And yet, despite the wonder of it all, the basic concepts of radio are the fundamentals of this great new adventure.

For youth today the study of radio and its principles is the first step to wonders yet unknown. It is the first step to be encouraged by man in his efforts to give to youth what he himself might have missed or only partly entered into. Never before has such a challenge been extended to youth as this challenge to explore the never-ending world of electronics.

In pursuit of this thinking the Wireless Institute of Australia is promoting the growth of a Youth Radio Club Scheme throughout Australian Schools. Already some thirty such clubs are in existence, bringing to youth at a bright young age the opportunity to take that first step towards the challenge of exploring the technical world ahead, and in so doing assist them in science, mathematics and other subjects so important in the technological advancement of their country.

By every means we have at our command we should support and encourage such a scheme for the advancement of youth into the field in which we ourselves are so interested, a field in which our sons will be the scientists of tomorrow.

Elsewhere in this issue of your magazine is a call for those used or unwanted pieces of radio equipment—capacitors, sockets, valves, resistors—which will be wanted by the youths who take an interest in the Youth Radio Clubs. From these boys will come the Amateurs, who, like hundreds of those before them, will fill the technical posts in this young country of Australia which is surely taking tip its important role in the technological advancement of the world.

The Institute asks you to DO your part, not just THINK about it! Follow the instructions elsewhere in this magazine and send that unwanted equipment to your Division so that youth can gain the early knowledge so essential in this rapidly evolving world of electronics.

FEDERAL EXECUTIVE, W.I.A.

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Build a Multi-Band Bandspread Receiver* USING COMMAND 3-6 Mc. SET AS BASIS

LUTHER UYS, ZS6E

AFTER 10 years of mobile work I have found that the transmitting side of it presented no difficulty whatsoever, but the receiving end has always been a "pain in the neck".

Having tried about ten different types—with converters (both commercial and home-built), I found that they all fell far short of the "shack" standard. There was no bandspread, no selectivity and no noise limiters; in short, no reception if the signal was less than "9 plus".

This inspired, or rather, forced me to build something to meet my requirements.

The Command receiver is well known for its fantastic reception; but falls short on these points:-

- (1) Single band receiver.
- (2) No bandspread.
- (3) Broad i.f.s. (Not BC453).

The following is a step-by-step procedure to overcome these and other shortcomings.

STEP-BY-STEP PROCEDURE

1. Remove: bottom and top covers; all valves; all i.f. cans; r.f./mixer/osc. unit at bottom.

2. Rewire filaments to suit and replace with 6 volt valves if required, but leave 12SR7 detector valve until later.

3. Cut away wires at back and leave only h.t. filament, and pick up r.f. gain wire, i.e. pin No. 3 on back plug, pin No. 1 on front plug and insert 10K pot. on front for r.f. gain control.

4. Pick up b.f.o. shut-off wire, i.e. pin No. 4 at back or pin No. 5 front plug, and insert switch to ground.

5. Cut away existing output transformer, i.e. T1 and replace with universal output transformer. Refer to main and sub-schematics.

This brings the main or normal modifications to an end (which most of you must have done already if your receiver is working).

The following steps are radical changes and must be followed to their logical conclusion, there will be no turning back.

6. Identify r.f./mixer/osc. sections thus: rx upright, then the antenna terminal will be at the left. From left to right you will find r.f./mixer/osc. at the bottom, each one being under its section of the main tuning condenser C4A, B and C.

Also, the r.f. coil has a red dot and will henceforth be referred to as L1; the mixer coil has a yellow dot and will be referred to as L2 and L3; and the oscillator coil has a blue dot and will be referred to as L4 and L5.

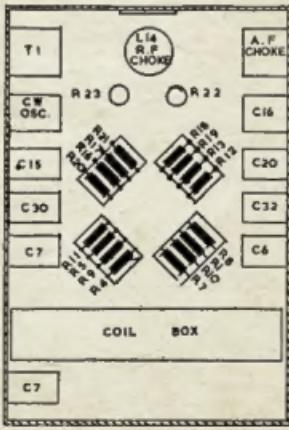
7. Make a good note of step 6, because you will be constantly referring back to it when studying these coils more closely.

• This article details, in an easy step-by-step manner, how a satisfactory mobile receiver can be made from the Command receiver having efficient bandspread, good selectivity, and effective noise limitation. Each step is carefully detailed for the constructor wishing to duplicate the author's work.

8. Remove the rx cover at the top of the unit. This will expose the r.f. (C4A), mixer (C4B), and oscillator (C4C) tuning condenser, i.e. your main tuning condenser. Observe the points of connection of the plug-in unit and count the pins clockwise.

9(a). Resolder: (a) r.f./C4A stator wire from pin 4 on to pin 5. (b) Mixer stator wire of C4B from pin 4 on to pin 5. See that the 100 pF. condenser remains in position. (c) Oscillator stator wire of C4C from pin 4 on to pin 6.

9(b). Remove: (i) The paddles and trimmers (the unit as a whole) from the oscillator condenser C4C and replace with a good quality 0.01 μ F. condenser to ground. (ii) All trimmers on top of C4A and C4B, i.e. two on each section. (iii) The existing antenna lug.



Underneath the Chassis.

View of receiver, inverted, and with front panel towards you. There are several other resistors and condensers not shown in the above diagram, but they are easily identifiable by inspection.

When these steps have been completed, close up the top section and turn the receiver upside down.

Now, counting the pins anti-clockwise:

10. Remove the green wire from pin 6 of the oscillator plug to the cathode of the mixer and insert a 5K resistor from pin 1 of this plug to the cathode of the mixer.

11. Remove all the 5K resistors from the oscillator coils—both the existing one and any new ones you may have scrounged—because step 10 will have taken care of this circuit.

This completes the wiring modification to the receiver side of the r.f./mixer/osc. unit. All other modifications to these sections will now be done on the plug-in units.

At this stage we will get the i.f.'s. in order that you can test as soon as you get the r.f./mixer/osc. plug-in unit going.

I.F. MODIFICATION

If the receiver you have is one with a sharp i.f.—Bob's your uncle, and nothing is required to be done. The i.f.'s. should be no sharper than 455 kc.; 700 kc. will also do.

12. Obtain three 455 kc. modern high-gain i.f. cans, e.g. the types that are used on a.c./d.c. sets 118-0-12, using 1655-1 in the 1st i.f., 1655-1 in the 2nd i.f., and 1655-7 in the 3rd i.f. (I used these and my modifications are based on them.)

13. Open the Command i.f. cans and cut the four pillars away with a hacksaw, strip the wires away from the pins and thus leave the plug-in unit free.

14. Enlarge the centre hole of the plug-in unit with a 3/16" drill, this will enable you to adjust the bottom slug of the i.f. can through the hole.

15. Now it is advisable to remove and replace all the existing 0.05 μ F. metal canned condensers that obstruct the bottoms of the i.f.s. with 0.05 μ F. paper condensers, making sure that you mount them in such a position that you can get at the bottom slug of the i.f. with a tuning stick.

16. Drill a 3/16" hole into the baseplate of the i.f. can by first plugging in the i.f. and then drilling through, as described in step 14.

17. Mount the new i.f. cans inside the stripped Command i.f. cans, making sure that:

- (a) Plate pin 4 of the new i.f. is connected to pin 1 of the plug-in unit.
- (b) H.t. pin 3 of the new i.f. is connected to pin 2 of the plug-in unit.
- (c) Grid pin 1 of the new i.f. is connected to pin 5 of the plug-in unit.
- (d) A.v.c. pin 2 of the new i.f. is connected to pin 6 of the plug-in unit.

*Reprinted from "Radio 23," September, 1962.

(N.B. Count the pins on the plug-in unit clockwise, looking from the inside of the can.)

Identify—

- 1st if.—L6, L7 (red).
- 2nd if.—L8, L9 (yellow).
- 3rd if.—L10, L11 (blue).

18. Replace the i.f.'s. and screw them down. Just remember that if too much gain is experienced (recognised by self-oscillation when you are peaking the i.f.'s), this can be cured by damping the primary of the third i.f., i.e. by soldering a resistor of anything from 50K to 100K across pins 1 and 2. This completes the modifications to the i.f.'s.

THE COIL-PACK

19. Constructing the r.f./mixer/osc. plug-in units. (Henceforth referred to as the coil-pack.)

With the plug-in coil-pack in position, mark off the centre and sides of the coil-pack on the sides of the receiver.

20. Remove the plug-in unit, place the bottom cover in position and transfer the markings on to the cover. You will have three markings on each side of the cover, check these with a set square and scribe lines across the cover. Cut the cover through the centre line and bend both sides inward at right angles on the two remaining lines. Now, if you have these covers in position, the coil-pack will be able to slide into position without you having to remove the bottom cover.

COIL DATA

Use $7/16'' \times 1''$ slug-tuned formers with the ribs cut away to leave a perfectly round coil former.

Band L1

80	35 turns Litz, 3/16" wide.
40	25 turns close wound, 28 s.w.g.
20	15 " " 24 "
15	12 " " 20 "
10	9 " " 20 "

Band Antenna Link

80	8 turns at cold end L1, 38 s.w.g.
40	6 " 38 "
20	6 " 38 "
15	6 " 38 "
10	6 " 38 "

L3

Same as L1.

L2

Same as Antenna Link.

Band L5

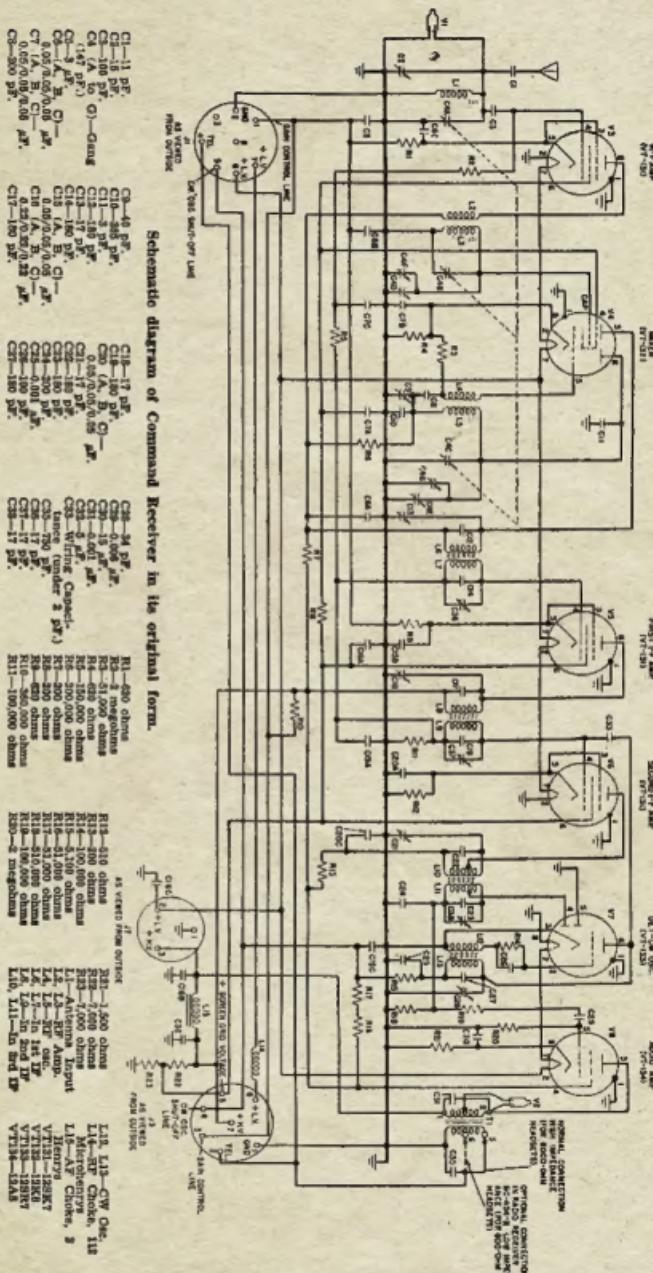
80	30 turns Litz, 3/16" wide.
40	23 turns close wound, 28 s.w.g.
20	15 " " 24 "
15	12 " " 20 "
10	8 " " 20 "

Band L4

80	6 turns, 38 s.w.g.
40	5 " " "
20	4 " 38 "
15	3 " 38 "

Note.—The 10 metre coils do not have slugs.

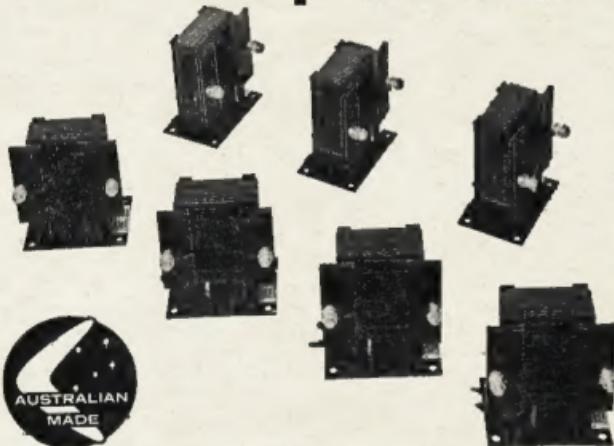
General Instructions.—See main script for mounting instructions. These must be read in conjunction with the coil modification data.



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21. As these coil-packs were not designed for continual plugging in and out, you must construct four little guides from aluminium, bent $1\frac{1}{2} \times 1\frac{1}{2}$. These are bolted to the sides of the receiver chassis to ensure proper positioning of the coil-pack.

22. The side-flaps which were originally used for bolting the coil-pack down must be modified in the following manner:-

- Remove the bolt-heads on both sides.
- Bend the points inwards, making sure that the sides have a spring effect to ensure a proper earth contact for the coil-pack, as good earthing is essential.

23. Check Step 11.

24. Decide on how many bands you wish to work, which will depend on how many coil-pack units you are able to scrounge. The modification of this unit was based on five bands.

25. Study coil-pack modification schematics closely, and set to work as follows:-

26. Mount the trimmers as shown in the pictorial of the new coil, making sure you are able to get a trimming tool through the can for trimming and lining-up the receiver at a later stage.

27. Mount coil-formers L1 to L5 between pins 6 and 1. In other words,

the coil-former is positioned slightly to one side, leaving you space for the trimmers.

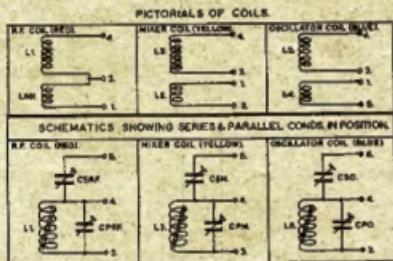
28. Get the oscillator oscillating 455 kc. higher than the r.f. signal and line the receiver up in the normal way, until perfect tracking is obtained. Repeat for each band. (Refer to line-up data.)

A.V.C., A.N.L. AND EXTRA AUDIO

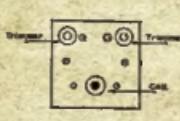
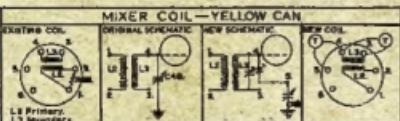
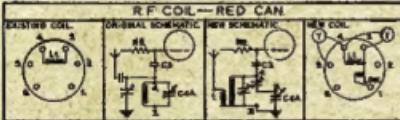
29. Refer to the relevant schematic. Remove C16A, B and C and replace with 0.25 μ F. paper condensers. (The 0.25 μ F. condenser C16A going to the middle of the wire-wound resistors is essential, as it is the common by-pass to all screens.) This step will take care of this. The C16B and C are not essential.

30. Mount a 6H6 valve in the space vacated by these condensers, making sure that pin 4 is the nearest to the side of the chassis. This will ensure that the plate, pin 5, will be facing pin 6 of the third i.f., in order that a 220K resistor can couple directly from pin 6 of the i.f. to the plate of the 6H6.

31. Remove the 12SR7 and replace with a 6SN7, balancing the filaments of the 6SN7 and 6H6 if 12 volt filament supply is used, making sure that the 6H6 has an extra resistor across its



COIL MODIFICATION.



NOTE - ALL COUNTING IS DONE ANTI-CLOCKWISE LOOKING FROM INSIDE THE COIL.
CAN IS LOOKING AT THE PINS.

filament to balance it against the heavy drain of the 6SN7. If you are using 6 volt valves exclusively, balance the 6SN7 with a 6V6 (the 6V6 valve draws 0.45 amp, and the 6SN7 0.8 amp, balance with extra 400 ohm resistor across 6V6) and the 6H6 with a resistor to ground.

Follow the schematic, which is self-explanatory. For those who may have difficulty in following it, we will continue with the step-by-step instructions.

Condensers in Series and Parallel Total Values

	Series Cond. in N.F.	Parallel Cond. in N.F.
Band		
80 Mx	65 pF.	30 pF.
40 Mx	30 pF.	30 pF.
20 Mx	50 pF.	30 pF.
15 Mx	30 pF.	30 pF.
10 Mx	50 pF.	30 pF.

	Series Cond. in Mixer	Parallel Cond. in Mixer
Band		
80 Mx	65 pF.	30 pF.
40 Mx	30 pF.	30 pF.
20 Mx	50 pF.	30 pF.
15 Mx	30 pF.	30 pF.
10 Mx	50 pF.	30 pF.

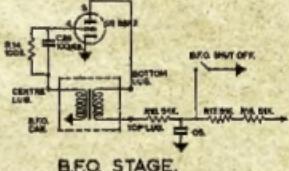
	Series Cond. in Oct.	Parallel Cond. in Oct.
Band		
80 Mx	65 pF.	30 pF.
40 Mx	30 pF.	30 pF.
20 Mx	30 pF.	30 pF.
15 Mx	30 pF.	30 pF.
10 Mx	50 pF.	30 pF.

Note.—Use 3-30 pF. Philips bee-hive trimmers fixed values as required, e.g. 80 mx.

32. Remove R19 from the tag strip.

33. Remove the wire connecting pin 6 of the i.f. to R18 (510K) and replace with a longer lead from pin 6 of the i.f. to the far side of R18, i.e. facing the middle i.f.

34. Insert a 0.01 μ F. condenser on the tag strip where R19 used to be and earth the other side.



B.F.O. STAGE.

35. From R18 (on the side facing the middle i.f.), insert a 1 megohm resistor and solder it to R11, which you have lifted from ground (R11 is the 100K resistor on the tag-strip nearest to the first i.f. base, but actually comes from the second i.f.).

36. To shut off the a.v.c., insert a switch from the junction of R11 and the 0.05 μ F. condenser (see C15A) to ground.

37. From pin 5 of the third i.f. lead a lead to pin 3 of the 6H6 and earth pin 4 of the 6H6.

38. Run a copper shield between the pins of the 6H6, i.e. from pin 1 to pin 6 and earth both pins.

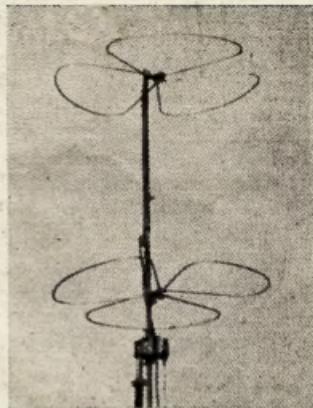
THE BIG WHEEL ON TWO*

Improved Omnidirection Coverage on 144 Mc. with Horizontal Polarisation

ROBERT H. MELLEN, WI1JD

and

CARL T. MILNER, W1FVY



FOR the two-metre buff, here is a new omnidirectional cloverleaf antenna with horizontal polarisation. Large size results in improved bandwidth and coverage over the popular halo, and gives superior anti-flutter properties in mobile operation. Singly or stacked, the Big Wheel is also a boon for local work from the home station.

Anyone who has been involved in local two-metre net operation knows that there are many times when the directivity of a beam antenna is a handicap, and some of its gain could be profitably sacrificed for good omnidirectional coverage. For the mobileer, an omnidirectional radiation pattern is a must. For him, there is only the choice of sticking with the vertical whip or, if he wishes to avoid cross polarisation, graduating to the halo or turnstile. In any event, there is a good case for the horizontally polarised omnidirectional antenna on two metres. The question is only what type best serves the purpose.

Halo and turnstiles are surely steps in the right direction. The halo, particularly, has one marked disadvantage.

It satisfies the polarisation requirement and has a fairly good pattern, but it suffers from small "capture area." This means less bandwidth and gain, and worse mobile flutter characteristics than are possible with antennas of larger size. The turnstile is somewhat better, but it is still a small antenna.

To study possible advantages of large size, we started experimenting with the old three-half-waves-in-phase type. This is a simple arrangement of three horizontal dipoles in a circle, fed in phase at the centre, as shown in Fig. 1A. Illustrations of this antenna are found in the literature but design details are lacking. This turns out to be a problem since, due to mutual coupling, both impedance and resonant frequency depend on the geometry. Thus the usual dipole formulae do not apply. Results of early tests of crude models of this antenna showed great promise, particularly for mobile use, despite poor matching.

The design shown here evolved not so much from trying to improve the matching properties, but simply to try something new. Instead of using the centre-connected transmission line, we decided to support the elements by feeders at each end instead of at the centre, as shown in B in Fig. 1. This proved to be a fortunate choice, as it resulted in simpler construction, better mechanical stability, and more easily adjustable electrical properties. Now each element is a full-wave loop, and it can be bent to try out various shapes and diameters. The idea is the same as before, however. The half-wave portions of the loop at the rim serve as radiators, while the radial portions at each end serve as quarter-wave feeders. Don't try to figure out where one ends and the other begins!

In designing this antenna, the first step was to settle on the shape of the elements. Various configurations were tried ranging from the most compact arrangement, a wheel consisting of three pie-shaped elements with an over-all diameter of about three feet, to a huge cloverleaf with oval-shaped elements and an over-all diameter of almost five feet. As a result of these experiments, we found that compactness makes matching and current equalisation troublesome. Curiously, the radiation pattern is only slightly affected by the shape. For each of the elements there always remains a slight "front-to-back" ratio, roughly 3 db. Variations in the

pattern of this amount are barely noticeable in ordinary use. This observed pattern is shown in Fig. 2.

The next step was to trim the elements to length and adjust the stub for best s.w.r. at the desired frequency. Since all elements are fed in parallel at the low-impedance point, the input impedance would normally be quite low. Each has a radiation resistance of about 30 ohms in this configuration, which would give only 10 ohms for the parallel combination. To match to a 50-ohm line, the conventional stub tuner scheme was used. Element lengths are chosen so that the impedance is capacitive and the circuit is then tuned to resonance with an inductive stub to give an input impedance of 50 ohms at the centre frequency.

The design described here has an over-all diameter of four feet. It is no more critical or difficult to build than a three-element beam. Elements are made of $\frac{1}{2}$ " o.d. corrosion-resistant aluminium tube. The lengths are bent cold to the shape shown in Fig. 3. For

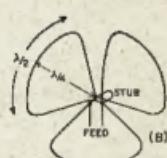
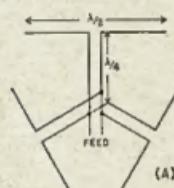


Fig. 1.—Development of the Big Wheel started with three half waves in phase, as shown at A. Despite poor matching initially, the antenna was improved, primarily by evolving into the cloverleaf style at B. Each element of the cloverleaf is one wavelength long. Feed impedance is brought to 50 ohms through the use of a tuning stub.

* Reprinted from "QST," Sept., 1961.

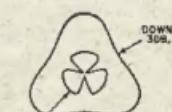
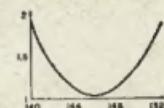


Fig. 2.—Performance of the cloverleaf array. Frequency response can be controlled over a wide range, depending on the shape of the elements and over-all size. The configuration shown here is designed over the 144 Mc. band if centred near 144 Mc. There is a slight dip in the radiation pattern in back of such notch in the cloverleaf, but this is hardly noticeable in ordinary operation. In mobile work it is insignificant.

good performance over the band, 80" lengths are used. The bracket and remaining hardware are prepared according to Fig. 3, and the elements mounted. Wood dowels are used to plug the element ends to provide strength and seal against moisture. The tuning stub is then cut to 5" over-all length, bent to shape and mounted as shown. Finally, the transmission line is prepared and connected. Keep the leads short or

the s.w.r. will suffer. After assembly the structure is checked for conformity to dimensions and is ready to go.

As shown in Fig. 2, the s.w.r. should be 1.2 or better over the band. The pattern should be uniform to within ± 2 db.

STACKING THE BIG WHEEL

Two of these antennae can be stacked for the home station with an increased array gain of about 4 db. To improve the radiation pattern, the stacked antennae can be staggered by 60 degrees.

Stacking increases the directivity only in the vertical plane, while horizontal polarisation and the omnidirectional pattern of the single antenna are preserved. This type of array is widely used in f.m., t.v. and beacon applications, where such properties are required. With the broad bandwidth and uncritical behaviour of the Big Wheel, it is not difficult to realise considerable stacking gain by adding more bays before reaching the point of diminishing returns. In fact, results can be achieved in all directions which compare favorably with a small beam in its best direction.

for coaxial line a full wavelength is about 53", due to the propagation factor of the line. The length of the coax is important, as both matching and phasing depend on it. The spacing is nominal, however, and it can be adjusted to make the phasing sections fit properly.

The arrangement for a two-bay antenna is shown in Fig. 4. A full wavelength of RG-11/U 75-ohm coax is used for the phasing section. It is driven by 50-ohm RG-8/U transmission line at a point $\frac{1}{4}$ wavelength up from the bottom, to achieve proper impedance transformation. The two ends of the coax are out of phase, so one of the bays must be turned upside down to put the antenna currents in phase.

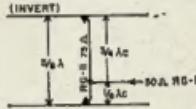


Fig. 4.—Stacking method for two Big Wheel antennae. Because of the finite character of coaxial lines, an element full wavelength of coax is approximately $\frac{1}{4}$ wavelength long. This is the optimum stacking dimension for dipoles. By using a 75-ohm phasing line with a 50-ohm transmission line, Note that one bay must be inverted to keep antenna currents in phase.

When the original 5" stubs were used, it was found that the point of minimum s.w.r. had shifted from 146 to 148 Mc., due to coupling between the bays. This was corrected by increasing the stub length from 5" to 6" total length. The resulting s.w.r. curve is almost identical to that of a single antenna. With the bays staggered 60 degrees on the mast the pattern variations are negligible. Gain is approximately 4 db. over a dipole.

For both mobile and fixed station, the Big Wheel has performed beyond our fondest hopes. Mobile results are particularly astonishing, as the troublesome rapid flutter is remarkably reduced. Our best testimonial was the occasion when one operator said he could not believe that such a strong, steady signal was coming from a moving car at such a great distance. At home it's a pleasure to be able to hear everyone in the Shoreline Net without continually fussing with a rotator.



SAD STORY OF C.H.C./H.T.H.

Overheard recently one W telling another that he earned his H.T.M. Award in 1 hour 20 minutes flat during a C.H.C.s. get-together in the States. I have no doubt the C.H.C.s. K9BX had him in mind when it came to his child of a boy, but with the advent of so many Stateside C.H.C.s. the award from the point of view of "standard of achievement" is at an all-time low.

There are those who like to belong to "socials," it is no doubt a "worthy", but from a DXer's point of view it has little merit.

It is good to seek awards, but only the right ones. There are those who are obsessed only by American R.B.'s highest endeavour and there are those who can be had for working a couple of stations and sending along 10-15 L.R.C.s.

There are those who provide some social status also. So let each Ham judge for himself.

Award hunting has now reached the stage where countless awards are available and it is pointless to continue stocking them into the bottom drawer.

73, Al VK4BS, C.H.C./H.T.H.

Gain of a stacked array depends on both the number of bays and the spacing between them. In these experiments the optimum spacing of $\frac{1}{8}$ wavelength was used. Two-bay arrays were tested, showing a gain over a dipole roughly equivalent to a two-element Yagi, but in all directions. It appears that 4, 6 or even 8 bays might be used, but the point of diminishing returns is rapidly reached, as the number of bays must be doubled for substantial gain and the length of mast required becomes a problem.

With a bay spacing of $\frac{1}{8}$ wavelength it is convenient to use full-wavelength phasing lines of coax. At 146 Mc. $\frac{1}{8}$ wavelength is approximately 50", while

[†] Extensive tests of the Big Wheel have been made by the Editor "QST", both at the home station and in the field. The single-bay cloverleaf array has given performance superior to any other single-directional antenna yet tried, and the two-bay system is all that the authors claim. In portable work, particularly, it has been found that a two-bay Big Wheel brings in signals with a strength comparable to a six-element Yagi, yet it delivers this performance in all directions and over a wider frequency range than is obtainable with parasitic arrays. Tests are currently underway with a four-bay system and results will be reported at a later date. —WHDQ.

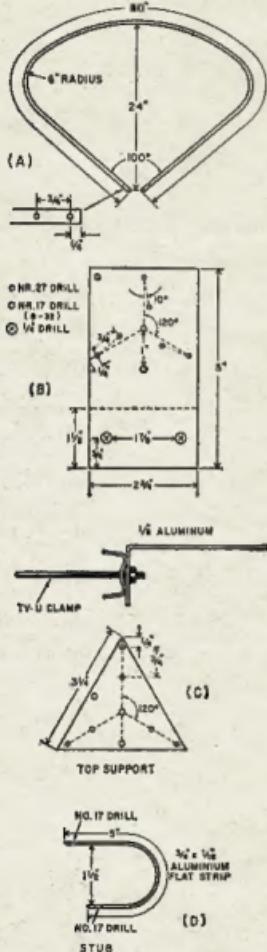


Fig. 3.—Structural details of the Big Wheel 2-metre array. One element is shown at A. A wood dowel 2 inches long is driven into each element to add strength. The grounded lower support is shown at B. It is bent down at a 90° angle and mounted on a mounting plate with a TV-U-type U clamp. The triangular top support is shown at C, and the tuning stub at D. The array is fed with 50-ohm coax, the inner conductor of which is connected to the upper support. Drills are 1/8" (No. 27) and 1/8" (No. 17). Dowels are 1/2" (No. 32) and 1/4" (No. 27). Brackets are 1/4" (No. 32).

Performance Tests on the Big Wheel 2-Metre Array*

Stacking Information and Results with Omnidirectional Antennae

In the previous article WIHDQ and W1FVY described a novel omnidirectional array for 144 Mc. mobile or fixed-station work. These fellows are now engaged in ice research in the Far North (at time of writing this), and there was not sufficient time for them to complete tests on stacked versions of the antenna before their scheduled departure, so the writer gladly took up where they left off. As is usual when one tries to get to meaningful numbers in connection with Amateur antennae (and by Amateur methods) this turned out to be no mean task.

On-the-air results are all that really count in evaluating the worth of antenna ideas for Amateurs. Precise measurement of pattern and gain are all but impossible, but if an antenna "has what it takes," protracted use of it under many differing conditions will show its superiority clearly. The "many" in the above sentence bears emphasis. Routine comparisons of various antennae can show widely different results. In fact, if they don't there is probably something wrong with the tester's methods. Reflections from ground, trees, buildings, hills, cars and the like add to or subtract from the direct signal to such an extent that "gain" figures taken by working stations and comparing signal reports show large variations from one station to the next. These are part of everyday v.h.f. communications, so the thing to do is to work many stations at various distances and directions with a given comparison set-up. Then, if you want to know for sure, you set up again in a different location and work another bunch. This is time-consuming, but interesting if one keeps a detailed log of the results.

The writer spent many hours at this sort of thing with the Mellen-Milner Big Wheel. Tests at the WIHDQ home location proved inconclusive, because of a side-hill test area, and trees, guy wires and towers in the way of anything that could be worked on readily. So, after the matching problems were worked out to our satisfaction, we took the collection of antennae and masts out to some of our favourite wide-open hilltops. The single-bay cloverleaf was mounted on a 15-foot mast. Two-bay and four-bay stacked arrays were tested on a 24-foot support. All were checked against the turnstile regularly used for mobile work. This put the turnstile in a seemingly unfavourable light, as it was used in its permanent position some 20' above and to the rear of the W1HDQ station wagon. The turnstile had established itself as an effective mobile antenna, however, so it was useful as a standard reference for checking results with the larger and higher arrays.

* Reprinted from "QST," Oct., 1961.

RESULTS

All told, around 100 different stations were worked or logged, and their signal strengths tabulated in terms of decibels above the readings obtained with the mobile turnstile. Care was taken to see that these stations were in various directions, at all possible distances, and well distributed throughout the active portion of the band. As expected, indications from these tests varied widely, but we feel that enough of them were made so that they are valid indications of what can be expected from various versions of the Big Wheel. It should be stressed that the margin credited to the single-bay Big Wheel over the turnstile is largely the result of the former having been mounted at considerably greater height. These tests were not intended to show the relative merits of the turnstile and Big Wheel; the turnstile was used merely to provide a reference against which all other set-ups could be compared.



Fig. 5—Feed system for a four-bay version of the Big Wheel antenna array. The two center bays are the same side up, while the two outer bays are inverted. Bays are approximately $\frac{1}{4}$ wavelength apart physically, which permits the use of full-wave phasing sections between them. The feed point of each pair is taken far enough away to avoid standing wave sections, and a 50-ohm line at the midpoint sees an almost perfect match. The tuning stubs on the two inner bays (see previous article) are 7 inches long, while those on the outer bays are 8 inches.

The tabulation below includes only received signal strengths at WIHDQ/1. Many reports were taken from stations worked, but individual S metre readings varied so widely that no numerically-useful data could be obtained from them.

Average gain, 1-bay cloverleaf over turnstile	5.7 db.
Average gain, 2-bay over 1-bay	6.2 db.
Average gain, 4-bay over 1-bay	8.1 db.

The "gain" obtained with the 2-bay Big Wheel appears out of line, but more readings were taken with various versions of this array than any other,

and we can assure the reader that the 2-bay version really does perform. Time and again, signals which could be heard only as faint whistles with a beat oscillator with a single-bay antenna jumped up to solid voice readability on the 2-bay version. These were not included in the tabulation, as the strength of the non-readable signals could not be established readily, but they do show that a stacked Big Wheel does what everyone wants an antenna to do: it brings in signals that cannot be heard with simpler antennae. It should be emphasised, however, that these are not antenna-range measurements, and should not be interpreted as such.

The stacked versions proved to be nothing short of spectacular on signals coming from extreme distances. On one occasion a signal from a New York area station was totally inaudible on the single-bay and the turnstile, yet it was a readable S3 on the 2-bay array. This was over an indirect hilly path of some 75 miles, and the test was made around 1 p.m. on a hot summer day, when tropospheric bending was at a minimum. Tests made at night often showed the 2-metre band loaded with weak signals, fading into and out of the noise, when either the 2-bay or 4-bay stacks were switched to the receiver. Tuning the band with the turnstile and single-bay antennae under the same conditions would show only the strong signals of locals and near-locals. Many contacts were made at distances up to 100 miles or so from locations where long experience in the past has shown that some form of beam is a must for raising stations at anything like this distance.

We worked hard at trying to make the stacking of two pairs of antennae pay off as much gain as did the stacking of two single bays, but this would not quite "come off." The indicated gain from the latter is more than would be expected on the basis of stacking theory, but it was there, over and over again, in unmistakable fashion. This is probably due to the nature of v.h.f. propagation, wherein lowering and narrowing of the vertical pattern pays off in surprising fashion on some paths. You get this when you begin stacking. More stacking pays off, but not so spectacularly as the first step.

But a gain of 8 db. with an omnidirectional antenna is not to be sneezed at. You'd have to put up a pretty fair Yagi to equal this and remember the 4-bay Big Wheel gives the gain in all directions. This is not an unalloyed blessing, however. The stack of Big Wheels is fine for net activity and local rag-chewing, but its omnidirectional pattern and high gain can multiply QRM problems many fold. The 2-metre band becomes a mass of heterodynes when some tropospheric bending is present. Another feature on the debit side: interference from commercial signals in the v.h.f. range multiplies with an omnidirectional array of such beautifully broad frequency characteristics. We were forced to abandon work with the Big Wheels in one favourite location where there are two f.m. stations, a u.h.f. t.v. station, and various police and forestry-service re-

(Continued on Page 13)

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V.H.F. AERIAL MATERIALS*

D. A. S. DRYBROUGH, B.Sc. (BRS22550)

MOST Amateurs interested in v.h.f. or u.h.f. operation would like to experiment with aerials, knowing that they play a very important part in the overall performance of a station. However the availability of cheap and effective commercially-made beams may well have discouraged some from taking up this aspect of station design, especially where a fair amount of "plumbing" appears to be involved. Not everyone thrives on the bending, shaping and fixing of aluminium tubing, such as is called for in most v.h.f. or u.h.f. serial designs, and it is the purpose of this article to point out that such skills are not really necessary because other, more easily handled, and cheaper materials can be used for most aerial experimental work at these frequencies.

The idea of using other materials occurred to the writer during a visit to the Lichfield I.T.A. station some years ago when the engineer-guide showed the party a spare element for the aerial then in use. It was galvanised! If such a finish was considered suitable for a high power v.h.f. t.v. serial, then it would surely be worth investigating for Amateur use. A check was therefore made into the relative merits of various materials for use as v.h.f. serial elements with interesting—and cheering—results.

The radiating efficiency of an aerial can be defined as the ratio of the power radiated by it to the power supplied to it and is sometimes quoted as a percentage. The difference between the radiated power (P_r) and the input power (P_{in}) is the power lost in the aerial itself (P_L). The aerial can therefore be given the equivalent circuit shown in Fig. 1 (b) because power in such a circuit can be lost only in a resistive element and both power-dissipating mechanisms in the aerial can be replaced by resistors, R_r and R_L , such that together they dissipate the same total power as the actual aerial does. R_r , proportional to the power radiated by the aerial, is then the "effective radiation resistance" of the aerial while R_L , proportional to the power lost in the aerial elements, is the "effective loss resistance". When considering the relative efficiencies of various materials as aerial elements, Amateurs are vitally interested in the behaviour of the "effective loss resistance" (R_L), as defined above, of an aerial system when the materials of which it is made are changed.

Starting from the fact that most aerials are made up of arrangements of lengths of metal of more or less uniform cross-sectional area the "d.c." resistance of such a length, say L , with area A , can be calculated by applying the formula:

$$Rdc = (L + A) \times \text{resistivity},$$

where resistivity is the resistance per unit length and unit area for the

material involved, usually given in ohms per centimetre cube. Taking L as a half-wavelength at 145 Mc. and A as the area of $\frac{1}{4}$ " diameter rod, typical values of Rdc are as follows:

Metal	Resistivity (ohms per cm. tube)	Resistance Rdc
Copper	1.72×10^{-8}	0.0023 ohm
Aluminium	2.83×10^{-8}	0.0037 ohm
Zinc	5.90×10^{-8}	0.0077 ohm
Brass	7.50×10^{-8}	0.0098 ohm

All these are negligible with respect to the radiation resistance (R_r) of a half-wave dipole which is about 63 ohms for the chosen element diameter, but this is not the whole story. As the frequency of the current flowing in the material is increased from "zero frequency," or d.c., an effect, called the "skin effect," modifies the current distribution in the cross-section of the conductor, tending to concentrate it more and more in its outer skin as the frequency rises—hence its name. This reduces the working area of the conductor and so increases its effective

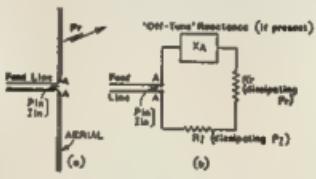


Fig. 1. Dipole aerial and equivalent circuits.

resistance. At v.h.f. the skin carrying most of the current becomes very thin indeed, less than half a "thou" (0.0005 inch), and is proportional to the square root of the conductor resistivity. Thus the skin is thicker for the metals with the higher resistivities, making their "r.f." resistance less relative to their "d.c." resistance than for the better conductors like copper and their use at v.h.f. less futile than might be assumed from their resistivities. The "r.f." resistance (R^r) for a current which is constant along the length of the half-wave element is found to be approximately as follows:

Metal	Skin Depth	R^r	Ratio $R^r : Rdc$
Copper	0.00022"	0.34 ohm	148
Alumin.	0.00028"	0.41 ohm	111
Zinc	0.00040"	0.60 ohm	78
Brass	0.00045"	0.68 ohm	69

These "r.f." resistances cannot yet be used to calculate the efficiency of a dipole aerial because such an aerial does not carry a current which is uniform along its length. The current distribution for a half-wave dipole is normally taken to be half a sine wave, having its maximum at the centre of the aerial, and so equal to I_{in} in Fig. 1. The average current and also the effective loss must therefore be less than

for the constant current case considered above and integration of the power loss over the whole aerial results in the value $0.5 \frac{I_{in}^2}{\pi} R^r$ or $P_{in} \times 0.5 R^r$. Since the input current to the aerial is I_{in} it follows that the true effective loss resistance, R_L , for a half-wave dipole is $0.5 R^r$. This value, and the corresponding radiation efficiency and selected loss in dB, is shown for the selected metals in the following table:

Metal	R_L	Radiation Efficiency	Loss due to Aerial Elements
Copper	0.17 ohm	99.75%	0.011 db.
Alumin.	0.20 ohm	99.7%	0.013 db.
Zinc	0.30 ohm	99.5%	0.022 db.
Brass	0.34 ohm	98.4%	0.028 db.

It should be noted that these results are for $\frac{1}{4}$ " diameter elements, not the more usual $\frac{1}{2}$ " diameter tubes. Such larger tubes would result in still lower " R^r " resistances although the " $d.c.$ " resistance of very thin-walled tubes could be greater than those quoted above for $\frac{1}{4}$ " diameter rods.

Simple formulas for those who wish to calculate skin depth and R^r for themselves are as follows:

$$\text{For solid rods, } R^r = Rdc \times \frac{\text{diameter in inches}}{4 \times \text{skin depth in inches}}$$

$$\text{For thin-wall tubes, } R^r = \frac{\text{wall thickness in inches}}{\text{skin depth in inches}}$$

$$\text{Skin depth, at v.h.f., in inches} = 2 \sqrt{\frac{a}{\mu F}}$$

where a is resistivity in ohms per cm. cube,

μ is permeability, taken as 1 for non-ferrous materials,

and F is frequency in cycles per second.

Having theoretically established that quite thin elements of a variety of metals could be used for v.h.f. and u.h.f. aerials, the next step was the choice of a suitably cheap, easily available and readily worked material with which to experiment.

Zinc wire is a rare commodity, of course, but a standard line in agricultural ironmongers is galvanised fencing wire in various gauges. This is iron wire with a very heavy zinc coating, entirely adequate to act as a zinc conductor at v.h.f. and u.h.f.; it costs only about 1/6 per pound. The length to the pound for 10 sw.g. wire, which has a diameter a little over $\frac{1}{4}$ ", is more than 22 ft., making the cost just over 1d. a foot. The wire can readily be shaped and soldered and is self-supporting for lengths of at least quarter-wave at 145 Mc. It can be fixed to wooden supports by means of staples and this construction is adequate for loft arrays. For Yagis a boom is required and $\frac{1}{4}$ " or $\frac{1}{2}$ " galvanised tubing can be used. This can then be drilled transversely at the appropriate element spacings for the

* Reprinted from R.S.G.B. "Bulletin," June, 1962.

1" diameter elements which can be fixed in position by soldering, using a normal, medium-sized, electric iron. construction results in a light, yet strong, aerial suitable for fixed or mobile application.

This cheap material has been used by the writer for a wide range of aerials with good results. The most spectacular perhaps, was a 10-turn, bi-directional helical aerial. This was supported from a 10 ft. 6 in. long wooden beam. Each turn was 26" diameter, spaced 14" from the next turn, and the aerial was split in the centre for connection to the feed line through a balun. The total conductor length used was about 65 ft.—think of coiling that amount of 1" diameter aluminium tubing into a smooth helix! On this aerial, ILSVS was heard in the summer of 1959 on sporadic E—a fluke of course, but useful for proving that the aerial did work!

Slot aerials are especially easy to make and mount and another bi-directional array consisting of two such slots, stacked one above the other on a wooden pole some 20 ft. high, was used with good results for an extended period. Folded dipoles are also convenient and a pair in a broadside or "flat top" array was used for a spell in the loft. Yagis of various sizes have also been tried. The outside aerial at the moment is a four-element, wide-spaced unit, supported by a bamboo pole about 7 ft. long which is cleated to a wall so that the Yagi is about 12 ft. above ground. Even in the writer's rather

poor QTH this aerial has performed well and has weathered many high winds in the two years it has been erected. Since January 1961, 40 countries and eight countries have been heard using it, indicating that its performance has not yet been affected by corrosion.

A word of caution is necessary about the substitution of the smaller diameter elements for other sizes in published designs. The length of 1" diameter rod required for a half-wave dipole is about 0.856 wavelength (exact half wavelength) instead of about 0.94 wavelength (exact half wavelength) for 1/2" diameter elements; an increase in length of about 1.7 per cent. This correction can be applied to parasitic elements of the same order of length in Yagi arrays but element spacings need not be altered.

The thinner elements exhibit a narrower bandwidth and this may become significant, even for the relatively narrow Amateur bands. In the case of close-spaced Yagis or other aerials which have a very low impedance feed point.

Very little attention has been paid to the 430 Mc. band and higher bands,

mainly because the writer has not yet operated in any band higher than 144 Mc., but, theoretically at least, the fencing wire should be even better at the higher frequencies. This arises because, with increasing frequency, the "r.f." resistance of a given length of material rises only in proportion to the square root of frequency, whereas the length required for a half-wave dipole decreases inversely as the frequency.

The "r.f." resistance of a dipole therefore decreases in inverse proportion to the square root of frequency, and is therefore only about $1/\sqrt{3}$ or 0.58 of the 145 Mc. figure at 430 Mc.

The radiating efficiencies of such dipoles, constructed of the zinc-coated metal, should be indistinguishable from those of aerials using larger aluminium or copper elements and the diameter of 1" should be mechanically adequate for all normal element lengths and perhaps even for mounting booms. It is hoped to try such an array shortly when a new 430 Mc. converter has been constructed.

REFERENCES

"Radio Engineering," E. K. Sandeman.
"Radio Engineers' Handbook," F. E. Terman.

VK2AHM—R. J. WHYTE



R. J. (Jeff) Whyte, VK2AHM, is seen in his shack with the equipment used during the 1962 Remembrance Day Contest.

From the left we have, firstly, a Racal RA-17-L receiver, surmounted by a barely discernible Collins TCS transmitter. These were used on 160 metres. Second in line is a Drake 2B receiver; followed by the 32 volt operated receiver, comprising a Geloso front-end (much modified) feeding into a BC453—again with changes to suit 32 volts. Just visible above his shoulder is the dial of the main, remotely controlled v.f.o. (Older Hams will remember VK2AHM's "Steco" v.f.o., using EP50 tubes. This tunes the latest model.) Next to his head is the main transmitter, with an 813 switching from 10 to

80 metres. To the right again is the modulator for same. A pair of 813s, zero bias. Below is the 32 volt operated transmitter, a pair of 807s used for both a.m. and d.s.b.

Above VK2AHM's head is the terminal panel for the eight vee beams and the rhombic that are in general use. Above again, an antenna tuning device and a pair of speakers.

Only a portion of the control panel is visible on the bench. Once switches are thrown there, the requisite receiver and/or transmitter comes under the control of a single, foot-operated switch.

All the a.c. operated gear is powered by a diesel-driven alternator.

VK2AHM concludes, "The Racal and Collins affairs, I regret to say, are not mine."

These non-Amateur stations give little, if any, trouble in this fine mountain spot when a Yagi antenna is used. The Big Wheel should prove a blessing in many types of 2-metre work, however. If you can take the jibes of pedestrians and passing motorists, a single Big Wheel should give you the best 2-metre mobile signal in your area. If you live in a spot where you can put up only one antenna, and rotators are out, a stacked Big Wheel will make the 2-metre band a lot more interesting for you than it ever was before.

Reports following the appearance of the Big Wheel in "QST" indicate some confusion about the construction of the antenna. Referring to Fig. 3 (previous article), each element (A) runs from the grounded plate (B) to the triangular plate (C).

These two plates are mounted one above the other, at a spacing determined principally by available insulators. Ceramic standoffs 1" to 1 1/2" long are suitable. The Johnson Steatite cone, part 135-501, 1" long, with 8-32 threads, is good. The designers also used a bakelite block 1" long, with molded-in brass inserts, though we do not have a part name or number for this.

The tuning stub (D) is shown bent around a 1" radius, but this is not critical. Note that the stub length is 6" for a single bay. For a stacked 2-bay system the stubs should be 6" long. In a 4-bay array the top and bottom stubs are 6" and the inner pair 7". For a single bay mounted above a metal car top for mobile work, a 6" stub may be needed.

—E.P.T.

MODERN RECEIVER FOR THE AMATEUR BANDS*

Further Circuit Points, Construction and Setting Up

PART TWO

J. D. HEYS, G3BDQ

BEFORE proceeding further, attention is drawn to the following amendments to Part One of this article: In the table of values on page 10 (Oct. '62 "A.R.") R7 (1,000 ohms) and R30 (250K, l.w.) should have been included. Also, on page 18, fourth paragraph, the tuning range of the variable frequency oscillator ought, of course, to have been given as 1855-2465 Kc, and not as stated.

As already explained in Part One, provision has been made for both carrier and product detection. When SW3a is in the s.s.b./c.w. position (see Fig. 2, pages 10 and 11, Oct. issue), h.t. is applied to the 7380 valve (V8). The secondary of the final i.f. transformer IFT4 is also connected to one of the beam-deflecting electrodes (pin 8—see Fig. 2, V8) of the product detector via SW3b. Use is made once again of the cathode tap oscillator circuit and the 7380 valve provides its own b.f.o. injection. L11 was made from a midget LW aerial coil of the type sold for crystal sets, and a few turns were removed to make it tune to 460 kc. when using the capacitors indicated (C65 and C66).

An OA79 semi-conductor diode, D1, is connected from the control grid of V8 to earth and this prevents the grid approaching earth potential. (Without this diode there would be considerable distortion.) Audio output from pin 6 of V8 is taken to the audio gain control R40 through a simple r.f. filter comprising R42, C54 and C55.

With SW3 in the a.m. position V7b operates as an infinite impedance detector, which is really a kind of cathode follower. The blocking capacitor C38 is necessary owing to the possibility of h.t. being applied to the grid of V7b should SW3 not be of the break-before-make type. Audio output from the cathode of V7b also runs through the r.f. filter network.

The grid and anode of V7a are strapped and connected to the secondary of IFT4 through a blocking capacitor C37. A fixed bias derived from h.t. is applied to the cathode of V7a to prevent operation of the a.v.c. circuit when receiving weak signals. The time constant of the a.v.c. system is arranged for a slow decay which enables satisfactory reception of s.s.b. and c.w. signals and renders S meter readings of these fluctuating signals an easy matter.

THE OUTPUT STAGE

The usual precaution of running leads to and from the a.f. gain potentiometer R40 in shielded and earthed wires is

* Reprinted from "The Short Wave Magazine," July, 1962.

observed to prevent instability and hum. The triode section of V9 is a normal voltage amplifier which is R.C. coupled to the pentode control grid. By using a 500-ohm potentiometer R35 in parallel with R36, it is possible to take off a positive reference voltage for the S meter circuit. This voltage should be equal to the no-signal cathode voltage of V8, which is about 2 volts. Under these conditions the S meter will read zero, although in practice it is better to set R35 to give a meter reading of S2 for more realistic reporting. Signals strong enough to overcome the fixed a.v.c. bias on V7a will cause a reduction in the voltage on V8 cathode and bring up the S

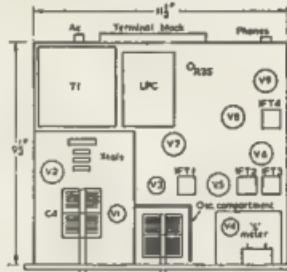


Fig. 2—Layout of chassis and arrangement of the main items in the G3BDQ receiver compare with one of the photographs. This drawing is not to scale and is intended for suggestion only.

meter. R41 across the meter enables the operator to set things so that the strongest signal likely to be encountered cannot pin the needle against its stop.

In the circuit diagram (Fig. 2) the headphones and speaker are arranged to operate together. Should phones-only reception be required a shorting switch can be wired across the output transformer secondary. R34 limits the anode current of V9 and whilst hardly affecting the power output, greatly reduces the heat dissipation of the valve.

POWER SUPPLY

A C-core mains transformer acquired cheaply on the surplus market provides power for the receiver; this type of fully screened transformer seems to be much more reliable than the normal drop-through variety and the writer has never had one break down. The 5-volt rectifier filament winding is not used because the silicon diodes D2 and D3 provide h.t. rectification and this all helps to lighten the load on the prim-

* The first part of this interesting practical article appeared in our October 1962 issue, and it will be necessary to refer back to it to follow the discussion here, which concludes the treatment.
—Editor.

ary of T1. After several hours' operation the transformer remains cold to the touch. C67 and C68 are high voltage disc ceramic capacitors and help to reduce any mains borne interference. Two one-amp. fuses are used on the input side and a 200 mA. pea bulb serves to fuse the d.c. output. This also affords some protection to the silicon diodes should an accidental short circuit occur.

Two 6.3 volt heater windings are used, one for each half of the total current load. By having a choke input smoothing circuit the output voltage is 200v, which is adequate for the valve types used in the receiver, and regulation is improved. SW3d and SW3e are wired to give "Off" and "Standby" switch positions, centre tap switching being employed.

CONSTRUCTION

The receiver is built around a vented cabinet measuring 13" x 9" x 10" deep. This item, together with a matching 2" deep aluminium chassis and a special 1" aluminium panel, completes the cabinet. This type of cabinet is perforated for approximately two-thirds of the total top and side areas. If ordering a similar cabinet it would be as well to ask for a 1" slot to be cut out at the rear to allow easy access to the terminal block and serial socket.

Side brackets were fitted to strengthen the chassis assembly and to minimise panel movement. Fig. 3 shows the location of the main components above the chassis, and it will be seen that despite the bulk of the mains transformer and smoothing choke there is no crowding—and see rear view photograph. This can be partly explained by having worked in three dimensions, the front-end and Q multiplier units being "above deck". A large section of the chassis beneath the front end unit was cut away to allow easy access to the cores of the pre-selector coils.

The underside view of the receiver reveals a U-shaped aluminium screen behind which are housed the detector circuits and SW3. It is important that the b.f.o. wiring be kept within this screen to prevent b.f.o. voltages leaking back ahead of the product detector. Should this happen it will give rise to a considerable S meter reading when the b.f.o. is running.

Normal practices should be observed when wiring the receiver. Short direct leads, and the positioning of resistors and capacitors parallel to the chassis sides all help to prevent a rat's-nest appearance. Since the receiver was built some small 0.1 μ F. ceramic capacitors have become available, and these could conveniently replace the somewhat larger paper types used.

A word perhaps should be said regarding the finish and appearance of the front panel. Many Amateurs produce

efficient and reliable equipment which is unfortunately spoilt by an untidy panel layout. The first consideration is the main tuning dial. Space was at a premium when designing this receiver so thoughts of horizontally scaled slide rule dials were dismissed and a Muirhead instrument vernier dial and slow motion assembly was used. This item is available on the surplus market at a small fraction of the cost of more showy yet often less effective alternatives. With the Muirhead, logging positions to one part in 1,000 can be noted, and the action is silky and positive with no trace of backlash.

The remaining controls are arranged along horizontal lines and help to give (what is hoped is) the professional touch to a piece of home-built equipment. Chrome-plated bolt heads and lettering transfers add finish to the general appearance.

INITIAL TESTING

Assuming that the front end unit has been built along the lines suggested, and tested, it can be fixed into place on the main chassis. The second mixer and i.f. stages can now be tested, and for this purpose an old BC453 or "Q-Fiver" may be pressed into service. With only V1, V2 and V3 in position the BC453 is loosely coupled to V3 anode and tuned to 460 kc. Signals should be heard, and the top band tuning range is best suited for this operation, there being a number of identifiable stations on at all times. If all is well, V3 can be inserted and the BC453 coupled in turn to its anode. Most i.f. transformers sold these days are pre-tuned to 460 kc. or 485 kc. and very little adjustment of their cores should be needed. If any instability is noticed this must be righted before proceeding further.

V6 is tested similarly, and you must remember to keep backing off the gain of the BC453 as you work along the i.f. strip! It may be that the top-coupled windings of IFT2 and IFT3 cannot be pulled on to frequency with core adjustments. This is because if. transformers are designed to work into normal valve inter-electrode capacities, and should this be the case some extra capacity will be required across the i.f. transformer windings in question.

V7a, V7b and V8 should work satisfactorily if they are wired correctly and no special test procedures are needed. The b.f.o. circuit must be tuned so that at mid-setting of C65 (pitch control) it oscillates exactly at the i.f. of 460 kc. Once more the "Q-Fiver" can be used to achieve this.

It should now be possible to use the receiver on an aerial and there only remains the correct setting up of the S meter circuit and the testing of the Q multiplier. The latter must be tuned to the centre of the i.f. passband by adjustment of its coil core and by the pre-set capacitor C47. V4 should just go into oscillation at one end of the track of R33. If it fails to oscillate the values of R30 and R31 may be changed to increase the anode voltage of the 6CW4 valve.

A point not to be overlooked is that the receiver is designed to work with a low impedance aerial input. This may entail the use of an a.t.u. should the station aerial be a long wire or the proverbial "piece of wet string". The receiver will certainly work with a bit of wire tucked into its input socket, but first class results cannot be expected when used in this way.

CONCLUSION

A muting system has not been incorporated in the design as shown here,

for most Amateurs have their own individual send/receive systems and can adapt the circuit to suit their particular station switching arrangements.

Although many receivers have noise-limiting devices or circuits, the writer has never found it necessary to use them at his QTH except when operating on ten metres or the v.h.f. bands. If the constructor has a particularly noisy location there are many effective and tried circuits which could easily be incorporated in the design.

Whether the whole receiver is constructed or whether instead only certain sections or ideas are borrowed from this article, the writer feels sure that the results obtained will be well worth the effort. Only the usual hand tools were used for the constructional work and a small square-tipped wooden stool served as a workbench. This was because of the normal state of the real workbench, it being cluttered with numerous pieces of gear finished, unfinished or abandoned!

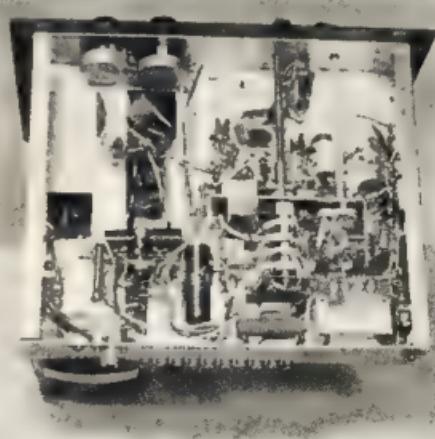
The completed receiver has now taken over the function of main station receiver; the trusty AR88 has been relegated to stand-by and other secondary uses.

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Rear view of the 5-valve double-conversion Amateur-band receiver designed and built by GABDQ. The C-core transformer and choke are both inexpensive surplus items. All parts used, including the latest valves incorporated in this design, are catalogue items obtainable from Amateur Radio supply houses.



Underside view of the Amateur-band receiver, showing screened compartment for the product detector and b.f.o. circuitry, using a TMS6 in this position. Extension rods connect the function switch (SW3 in the main circuit) and the b.f.o. control with their knobs on the front panel. Output transformer T3 is in lower-right-hand corner of the chassis, and the pea-build serves as an h.t. fuse.

AN EASY WAY TO SHIFT COMMUNITY CRYSTALS

FOR many years now, large quantities of crystals have been available from disposals sources at relatively cheap prices. Many of these have been pounced upon by v.h.f. enthusiasts, particularly those with frequencies between 6 and 9 Mc., and used in converters and transmitters.

With the large amount of activity by stations using crystal-locked transmitters, particularly on 144 Mc., it is quite noticeable that a large number of Amateurs possess crystals on the so-called "community" frequencies. A good example of this is the 8036.25 kc. crystals producing output on 144.6525 Mc. in the two metre band.

Several Amateurs have successfully ground, or etched, these crystals to higher frequencies. But the majority of owners either put up with QRM, or put the crystal aside in favour of another which produces output on a clearer frequency.

The obvious answer to this would seem to be to use v.f.o. or v.v.c. control and these methods have much to recommend them.

However, another method of frequency shifting can be used quite successfully. This is the adding of lead, "Brasso," "Silvo," etc., to the surface of the quartz crystal slab. Although this method lowers the frequency of operation, it has several advantages over the grinding or etching methods.

(1) If it does not work, you just scrub the crystal slab in warm water and it will revert to its original frequency, none the worse for wear (unless of course you have been clumsy enough to break it).

(2) If the new frequency becomes inhabited by stronger stations, you can easily shift frequency again to another clear (?) spot.

(3) If, when trying to put the crystal on a specific net frequency, you go too far, all you have to do is wash the crystal and start again.

About the only disadvantage is that over a period of time—something over one to two years—the crystal may drift slightly in frequency, although one of my crystals has apparently remained stable over a period of at least two years.

For relatively large excursions in frequency—up to 300 Kc. on 144 Mc. using an 8 Mc. DC11 holder crystal (slightly less with smaller crystals such as the FT243)—"Brasso" or "Silvo," etc., seems to be best.

After pulling the slab out of the holder, it is advisable to wash it thoroughly with a tooth-brush and warm water. Do not use soap because it is difficult to remove completely when drying the slab, and it may have peculiar effects in the way of frequency drift.

After drying thoroughly with a lint-free cloth, apply a coat of "Brasso", etc., to one side. Allow to dry for several minutes and then polish with a cloth.

Then place the slab back into the holder and check the frequency. If it won't oscillate, take it out again and polish some more, adding more "Brasso" if necessary.

Too thick a coat may also retard oscillation and it may be necessary to wash the slab and start again. This will also be necessary if the crystal oscillates on two frequencies. However, nine times out of ten the crystal will work satisfactorily at the first attempt.

If you want to move it slightly lower in frequency, more polishing of the existing coat will do the trick. This seems to hold true even after a period of several months. But, if the frequency is too low, it will be necessary to wash the crystal slab clean and then apply a lighter coating of "Brasso", etc.

Most of my crystals have operated on numerous frequencies over the last 2½ years, but the current resultant frequencies on two metres are 144.440 Mc. for a crystal normally producing output on the "community" frequency of 144.6525 Mc., and 144.097 Mc. for a crystal normally on 144.1825 Mc.

If it is only required to lower the frequency of operation a few kc. on the output frequency, it seems preferable to use lead from a soft pencil, solder, etc., and apply short strokes to the centre of the crystal slab.

In my case a crystal on 7940 kc. was etched to a frequency slightly higher than that required to produce output on the desired net frequency of 144.500 Mc., and then brought down to zero soft—1B—lead pencil.

These methods of shifting crystal frequencies may seem strange, but they have been used for many years in various forms, and they do leave large margins for error.

I hope that a number of v.h.f. Amateurs read this article and try the methods outlined. If so, maybe there will be fewer pile-ups on the "community" frequencies.

See you on "two" on "Brasso" control.

—Bill Roper, VK3ARZ.

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" 3014	1"	8 "	8/5
" 3015	1"	16 "	8/5
" 3018	1 1/2"	8 "	10/6
" 3019	1 1/2"	16 "	10/6
" 3097	2"	10 "	13/9

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SIDEBAND TOPICS

(Continued from Page 17)

The foregoing was reported by Irvin Dorothy Strauber in the s.s.b. department of "CQ" magazine. They go on to say that with the large number of Amateurs in the United States leaving a.m. and going to sideband, and with so many newcomers starting phone with s.s.b., it is becoming apparent that with the division of the 20 metre band at present, the lower end is becoming increasingly more deserted, while at the higher end, the opposite situation obtains.

Here in this country, I feel that we would do well to follow these suggestions. The presence of s.s.b. stations from 14.2 Mc. down is not going to make much impact on the a.m. stations' capabilities to work DX, principally because the a.m. DX is almost non-existent with present conditions, which you must keep in mind, are still deteriorating. Also the a.m. and s.s.b. compatibility has been proven on the 40 metre band.

A concerted effort by those of us who use 20 metres for DX contacts would quickly establish the old methods used before the coming of sideband. For those of you who have no experience of this, the 20 metre band was segmented as follows:

14.0-14.1 Mc. C.W.
14.1-14.2 Mc. Mc. DX (i.e. non-W) Phone.
14.2-14.3 Mc. W Phone
14.5-14.4 Mc. C.W.-DX Phone.

The present suggestion is for a return to this plan with W/K phone extending from 14.2 to 14.35 kc. In the past, this plan worked extremely well and would now have an added advantage in bringing a.m. and s.s.b. together. When was the last time you contacted an a.m. station on 20 m? Your thoughts on this matter would be appreciated.

HOW MANY?

Do you know that Comps VK5EF keeps a sideband register. This register is a record of those of us in this country who are using the modern method of phone transmission. As at the end of January, 1963, the number of s.s.b. stations by States makes interesting study. We cannot vouch for the accuracy of these figures (they are always increasing), but they are as correct as Comps can ascertain:

VK1	4	VK6	15
VK2	113	VK7	5
VK3	97	VK8	2
VK4	32	VK9	5
VK5	36		

N.S.W. is still holding a healthy lead. Are you sure that your call is in the Sideband Register? If not, send your card with brief details of your equipment on it to Mr. E. C. Daws (VK5EF), East Terrace, Gawler, S.A.

BOOK REVIEW

The A.R.R.L. has published the third edition of their popular "Single Sideband for the Radio Amateur". I am sure that this edition will be just as sought after and as useful as the last two have been. The manual is still a digest of articles that have appeared

in "QST" and while retaining quite a few earlier items on basic theory, many new articles have been included.

The chapter headings are the same as the previous editions but the material is very much up-to-date. The 7360 tube is given full treatment, modifications to old faithfuls like the Sideband Package and W2EYL phasing generator follow the original articles. Several new linear appear and the v.h.f. gang are not overlooked.

If you regularly receive "QST," you will not find anything new, but it

certainly is convenient to have all this excellent information between two covers.

If you are a newcomer to s.s.b. or thinking about joining the ranks of a large number of satisfied customers, you should not be without this new addition to the Amateur library, the latest and most modern sideband manual yet published.

My copy came direct from A.R.R.L., West Hartford, Conn., where the price is \$2.00 (U.S.). It should be available in Australia by this time at about 30/- per copy.

TWO NEW AWARDS

The Kroonstad DX Club has among its members many experienced DXers in various amateur bands including ZS4ANG, ZS4ATO, ZS4AU, ZS4JK and ZC4CO. In order to recognize outstanding achievements and all round operating ability in the DX fields in both phone and c.w., the Club has instituted two awards.

6 X 6 AWARD

To qualify for this award applicants must have proof of QSO with six different countries on each of the six continents. Of these six countries, three must have been worked on phone and the other c.w. in six different countries on the 6 x 6, 12 x 12, and 18 x 18 awards.

Stickers are available for 12 x 12 and 18 x 18 under the same conditions as above, i.e. half to be worked on c.w. and half on phone.

The 6 x 6, 12 x 12, and 18 x 18 are recognised by the Certificate Hunters' Club as three separate awards.

6 IN 6 AWARD

This award is for working the six continents within a period of six hours and is available

on a c.w. only or phone only basis. Each award is for one band—no award is given for more than one band. Therefore, the following different awards can be claimed: 28 Mc. phone; 21 Mc. phone, 14 Mc. phone, 7 Mc. phone; 28 Mc. c.w., 21 Mc. c.w., 14 Mc. c.w., 7 Mc. c.w.

No contacts made during any contest will be allowed and the application must be enclosed to effect the award.

For both the 6 x 6 and 6 in 6 awards, it is not necessary to send any QSLs if the application is countersigned by two other Amateurs, or Radio Club official, that the QSLs have been seen by them. However, the Kroonstad DX Club reserves the right to request any QSLs.

Both these awards are also available to Short Wave Listeners under the same conditions.

The cost of each award is five L.R.C. by surface mail or 10 L.R.C. (1 dollar in case of air mail).

For both awards apply to the Secretary, Kroonstad DX Club, P.O. Box 376, Kroonstad, South Africa.

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Sub Editor: BILL ROPER, VK3ARZ,

Lot 59, Orchard Street, Mount Waverley, Victoria

ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Very few v.h.f. Amateurs, whose transmitters are crystal locked, have facilities available to conveniently alter their own frequency in relation to other signals in the band. All v.t.o. controlled transmitters I have known (or should have) this facility which is known as the "nail" or "spot" position.

All that is required is that the oscillator be made operative, either by a third position on the V.F.O. switch or by a switch control, so that a signal can be heard in the rx and the operator is able to "spot" his frequency against adjacent stations. This should be done every time you answer a CQ or give one.

If there is a station already operating on the frequency, the correct thing to do is to stay off the air until you find another crystal station again, checking its position in the band. If another station is using the frequency you normally use, leave him be. He was there first. Do not try and blast your way through over the top of him. This is a shocking practice and happens far too frequently.

There are large expanses of vacant frequencies in all the v.h.f. bands so there should be no reason for heterodynes caused by adjacent channel interference.

Unfortunately the only notes that had arrived prior to writing this were those from Roy PAU and Al SZCR. Would all scribes please note that their notes should be posted to me no later than the first day of the month preceding publication. TS, JARZ.

VICTORIA

99 Mc.—This band was reasonably good during Jan. On Jan. 14 it opened to VK3, 4 and 2, ZL, and a VK6 mobile. Jan. 19 open to northern VK3 and southern VK4. On Jan. 20 there were passes, conditions all day with the band in and out to northern VK3 and southern VK4. At approx. 1500 hrs. E.A.S.T., 4Z7E at Longreach was worked and at 2000 hrs. a VK6 at Kalgoorlie. Again on Jan. 22 at about 1800 hrs. E.A.S.T. it was open to northern VK3 and southern VK4, as it was on 99 and 27th also.

New stations on 99 Mc. include Graham SZAA at Essendon, David SZOF at Moorabbin, Gordon JAZNN at Rockbank, and Dennis 3ZLY at Flemington. Ken 3ZCZ who has been portable in Hampton, will now build his VK3 portable by now, will be located at Beaumaris. Bill SATW hopes to be on 6 mpx soon from Hampton. Vic SZNN at Pascoe Vale has appeared on the band and is using 30W to an S15, a two element beam and a 10' mast. Peter SZGK has made a return to this band with mobile equipment which includes a v.t.o. controlled tx.

The Jan. 2 mpx scramble was held on Sunday, 27th Jan., at 745 p.m. Fifteen stations participated and the winner was Ken SZNNJ. The March scramble will take place on Sunday, 24th Jan., at 745 p.m.

144 Mc.—Several new calls were heard on 3 mpx during Jan., but the only one we have any information about is Peter SZCP, at Ormond. He is using a R. & H. converter, a turnstile antenna and a 10' mast. Tony SZNN at Swanbank, Gordon JAGV at Colac have been active on the band and Melbourne stations should keep an eye open for them as well. Ron SZEP at Ballarat and Col JPO at Waldron have been active on the country bands, while Maurice SZOL and Alan SZNH at Anderson. Ron JOM should be back on the band shortly and Fred SZNT should soon have his mobile gear operating.

The Feb. 2 mpx scramble was held on Sunday, 19th, at 745 p.m. Ron SZCP was contest director and the winner was Bill SZCH. Most of these country stations. Winner was Bill SZCH with 16 contacts and ZOCH and ZZNV were equal second with 14 contacts. The March contest will be held on Sunday 10th at 745 p.m. The Jan. 2 mpx was won by Doug SZCP and 30th with Tom JAGC piloting the fox car. Winner was Bill JAZRZ. The March for hunt will take place on Wed. 13th commencing at 8 p.m. from College Cres., at the rear of the Melbourne University.

The Jan. V.H.F. Group meeting, held at the W.H.R. room on Wed. 16th, saw 45 members in attendance. A large amount of business was discussed and then Bill JAZP gave a

very informative lecture on how antennas, particularly yagis, worked. Supper was on the menu and the meeting closed sometime after 11 p.m.. The March meeting will be held on Wed. 20th at 8 p.m.

I wonder how many VK3 Amateurs realize that there is an attractive certificate available to those who can produce 100 QSL cards confirming QSOs with 100 different stations on frequencies above 100 Mc. Claimants should apply to the V.H.F. Group, T. JAZZ.

SOUTH AUSTRALIA

99 Mc.—As these notes are read the VK5 beacon stations should be operational, its frequency is 99.5 Mc. for further data see "ART" for Jan.. The beacon has been under construction at the QFRC in "W." Patric SLA, and as we write it is only a case of obtaining the correct crystal and installing the rig at Mt. Lofty.

The thanks of the Group are extended to Bob SZDX (keying lamps), Rick SZFO (antennas), Bob SZFP (tr. & a.c.), Alf (radio support), and keying electronics), and Brian STN. The Group's thanks should also be extended to several large organisations who contributed parts (albeit unwillingly). Premium quality components are used throughout the equipment, although programmed mechanically.

New chaps on 99 Mc. include Bert SZDU at Rose Park, running 60W. to a 6/40. DX for Jan. was very good during the first portion of the month, but fell off thereafter.

144 Mc.—Biggest news on this band is SZGC at Broken Hill (270 miles). This chap is on 99 Mc. and although no contacts or details are on hand, he is quite well set up as he has so far worked three Adelaide stations (SAW and SZLDR). Now daily skeds are held between Adelaide and Broken Hill, between 8 and 10 A.M. and 7.30 P.M. and are successful high percent of the time. Other chaps are welcome to listen and call during these sked times as it is understood that the contacts into Adelaide are the only ones SZGC has had. Of course the broken line is not ideal for working into Adelaide for these skeds, and this will not favour VK3 or VK5, but the Mt. Gambier gang may find it worth while keeping an eye out.

A brief ionospheric opening occurred on 144 Mc. during 13U Jan. 1983. 4ZAX and 4ZAU heard VK5s and vice versa, but no QSOs resulted.

Sorry BNW at Crystal Brook has put up a 15 element yagi on 3 mpx (144.17 Mc.) and hopes for even better signals into Adelaide (160 miles). Also at Crystal Brook, and believed to be much better located than BNW, is SBCG. This operator is not yet registered, yet, but his 30' mast is going and it will be interesting to compare his signals with BNW's. SBCG's freq. is not known yet.

David 2AW has a 40 element array going on 2 mpx (x 10 element Yagis) and a new 4CW4 converter. David is now well into his second year of ionospheric work following his move from Tasmania. Another Elizabeth Amati, EUR. SDY, has been heard on 144 Mc. Brian SZBR now has a 10 x 10 element Yagi on 144.

General Notes—Les EZLS, accompanied by Colin and Trevor, are Mt. Gambier chaps who have been staying in Adelaide for a couple of months. They have a 10' mast and 1 mpx and are having numerous contacts, both portable and mobile. Activity in Mt. Gambier is at a high level according to these chaps and contacts on 144 Mc. as far as Melbourne have been reported.

Bob SZCP is getting mobile gear going on 144 Mc. What happened to the a.s.b., Bob? Hughie SZBC has been very active recently and has been working Adelaide stations on 2 mpx, including chaps in the difficult Eastern suburbs (SBQ and SZCZ). Brian SZBS, at Cheltenham, is now SZCL and SZDM is now SJQ.

Joe SZCP at Whylla has built himself a 50 ft. tower and hopes to work into Adelaide on 2 and 3 mpx. Doug SKK is now well and truly resident in Darwin; he has been worked by one well-behaved local. Doug has 20 contacts for the year. The call that he is operational on all bands 20 to 5 mpx. (Call ARKX now, of course). Doug's antennae were limited at the time of

writing, but he hopes for improvement here. Mick SZDZ has made his debut with the North Hull for VK5. Your conductor has built a transistorised v.t.o. for 30 Mc. (2 x OC11). Now let the mains voltage do what it likes! 73, SZCR.

FAIRFIELD

99 Mc.—With the exception of 1st Jan., on which VK5s 2, 3, 4, 5, and 7 were worked, no signals were received in Port Moresby during the month. This was partly due to the fact that I was absent from the home QTH for 14 days, mostly in the town of Gove/Papua New Guinea, who has since returned to Moresby, reported openings to VK on two occasions, although no stations were worked, and TE scatter 49 Mc. signals on one afternoon for several hours at Port Moresby. Paul advised that he has worked two stations at Gove/Papua New Guinea and that their signals may be heard in the near future. No further information on this at present. Also it is hoped that another VK5 Papuan station, approx. 150 miles from Moresby, will be established within the next few months as soon as suitable equipment becomes available. No further news from Jim SAB at Wewak, T.N.G., who should be back from his leave before these notes appear in print.

144 Mc.—No activity during the month. SAB listened during Dec. when the VK4/VK5 openings occurred and also carried out a test with 4ZAX without result.

T.V.—Channel 3 viewed on 16 days, signals being from ABQI and ABSS, also ABTS and ABVS on 1st Jan., 73, SAB.



Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

BOSS HULL CONTEST

Editor "A.E.", Dear Sir,

From an S.W.I.'s or my own observations on the Boss Hull Contest of 1982/83 I find that there is not enough support considering the number of calls registered. One finds a few very keen contestants while the majority say, "I'm not in it, but will give you a number," then amble on re their rig and general doing instead of letting the other chaps get more contacts and points. A good lesson in contest procedure can be learnt from VK4 contestants.

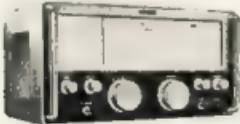
Recently I heard a VK5 full call operator suggesting to a Z call against v.t.o.'ing on to the ZL frequency because the stations VK5 and ZL may cover the weaker ZL callers, and stop a contact. On a number of occasions I have heard the same full call chap in contact with ZL on 51 Mc. going into lengthy detail of his trip to the country, why he came, the time he will be there, what a chance of the only DX to be had by them. If he wants to rag chew, why not go to the frequencies of which the Z calls cannot use, or get his contact and give the other lads a fair go.

With reference to the scoring system in the Boss Hull Contest, I consider that the old one similar to the R.D. would be preferable to the present method. The single point for an added contact, the chaps in and around the metropolitan areas and quite a handy number of points can be had, while the operators in the outlying districts have to rely on band openings. The R.D. is a good system, but it is not good for contests. The present system with a really good v.h.f. season, plus the mileage problem, and naturally big scores, must give the Contest Committee a lot of work, which being voluntary, could be made easier by a more simpler system.

—Chas. Abernethy, WIA-LERL

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Sub Editor: J. M. (Mac) HILLIARD, WIA-L3074

57 Gardiner Street, Blackburn, Victoria

ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Hi there fellow dial twisters! This month I would like to say a word or two to the newcomer to the s.w.l. ranks.

When you first begin to send out reports to a station, do not be too hasty to get that report off without first considering whether your report contains enough details. Make sure your report includes the following: Time, Q.M.T. should be used when reporting to an overseas station, date, signal report. The report should contain information of the QSO that you heard. Also if possible, the signal report that the transmitting station gives to the station he is working, and any other details of the transmission that you consider would be of interest.

Give courteous and friendly report in your report. Details on your equipment and your location. Any addressed envelope is always appreciated. If you are sending to an overseas station, it is suggested that where possible to include an international reply coupon.

There are times when a station may be having trouble with a particular report you hear. If a station is only 5S to 6, well give him that report, and not an 8S to 8. Naturally he will appreciate an accurate report. We take a very serious view of false reports being sent to stations.

There has become of many of you fellows that used to send us news of your activities! No doubt some of you now have call signs, but there are many that have not. But even if you are on the air, don't let that prevent you from writing to us now and again.

It has just occurred to me that if there are enough of you who listen on the v.h.f. bands, how would you like us to start a v.h.f. ladder as well as our usual DX ladder? Anyway, fellows, let's have your ideas on the subject.

VICTORIA

Maurie, our President, Ron Young and Ian Thomas have been flat out in the Ross Hull Contest. Ron recently put up a cubical quad for 59 Mc. and is very pleased with it, while Maurie has up a vertical dipole set. It still has not been pulled in the DX on it.

The DX ladder has really been given a shake by that old DX hound, Maurie. He has been getting something like four new countries verified each month. An interesting fact is that on the last day at your scriber's QTH was ZS8VK who was mobile in ZS1 land. But generally conditions have been very poor on the DX bands. Several interesting Russian stations were being heard on the short paths and an evening session of yours did not listen to s.s.b., and only to am, are certainly putting out as much DX, plus the fact that the QRN position is far less than with am.

At our monthly meeting it was decided to start an organized covering of the bands. The first run will cover 7 Mc. The idea being to listen on the band every Sunday for a month between 7 and 7.30 pm. Then we will compare notes at the next meeting. It certainly is a good idea of yours. Tom and I hope to have further activites along these lines providing we have good support from our members. So go to it chap and see what you can hear. We were pleased to welcome about five new members at the meeting. There were Michael and Robert. Please do have you with us boys and hope to see you at our future meetings.

Craig Cook has taken over the position as publicity officer, so woohoo you know me now. You have the world's broadest direct to airline. Any news at all will be very much appreciated. I can assure you, so go to it and let Craig know what you have been hearing.

It has been decided to hold our Convention now in April. Due to a number of reasons, the main one being that as the State Convention is being held in March, we felt that it would be better to have ours a bit later.

I feel that if I have not received any information from you in the last three months, I think it is only fair your name be withdrawn from the ladder until I hear from you again.

INTERSTATE ROUNDUP

Chas Abernethy has recorded a good score in the Ross Hull Contest, however he tells me he has been encouraging a friend of his who is a newcomer to the s.w.l. ranks, and he (the newcomer) amassed a much higher score in

the Contest. Nice going there young fellow and with a name like that you fully deserve to win the Ross Hull. It is very good of you Chas to give your time to encourage the newcomers to the s.w.l. ranks. Chas has the distinction of possibly being the first s.w.l. in V.F. to have confirmed all ZL districts. Well done Chas, and congratulations. Recently Chas received his certificate for the 1961 R.D. Contest.

Eric L3043 has recently returned from a holiday in VK4 and reports that he and his XYL had a very good time. Recently Eric received the D.I.E.R.U. award for some outstanding work in the VK4 Competition and such a wonderful effort. Eric received 563 QSLs last year from 108 countries. Many thanks for your very interesting letter, Eric.

Noel Harrison, L3101, despite his recent illness, comes up with a nice list of DX heard. Noel assisted 3WC to erect his Thunderbird TH4 recently. At present Noel is sat out learning c.w. so we wish Eric for some competition with Noel in the future. Noel's rx is working very well on a.s.b. and some good DX has been heard. Noel reports that EA4GZ was his only QSL for the month. While your scriber only received ZL1ABE from the Kermadec Islands, Noel has managed to obtain a QSL from W1ECR—this card is some 35 years old and is rather an antique.

Our good friend Peter Drew, L4021, has been busy battling with the DX on most of the bands over the past month. Peter listens at night on both 7 and 15 Mc., however he is finding the QRM rather a problem and as a result he has been QSYing to 3.5 and listening to 10 Mc. He has been keeping in touch with the static at this time of the year. Peter! He has been kept busy with letters from a number of American s.w.l.'s. and Name Very pleased to hear from you Peter and keep up a good work. Now come on you other Sandpaperers, how about giving Peter some support?

So until next month, 71, Mac Hilliard.

RE LADDER

	Countries	Zns.	S.s.b.	W
	Conf. Hrd.	Conf. Hrd.	Conf. Hrd.	Stat.
D. Trebilcock	277	253	46	24
D. Gledhill	117	98	36	16
A. Westcott	64	51	—	107
M. Hilliard	71	215	23	129
M. Cox	63	230	30	135
C. Abernethy	44	55	27	—
P. Drew	43	193	21	111
J. Harrison	40	102	27	14
F. Fields	28	124	16	85
D. Jenkins	25	133	—	11
H. Burger	10	166	7	—
	8	188	8	19

YOUTH RADIO CLUBS

Y.R.C. fortunes in VK3 go on to greater and greater strength, especially now that the High Schools have started coming in. Note the facts—more than 40 clubs, 90 elementary certificates, 6 junior certificates, 3 A.O.C.P. (and four more probables), but this is in VK3! I am making enquiries in other Divisions to check my information—you may have to pardon my virtuosity.

State is Club Leaders. Fathers don't take kindly to laying out \$10 or so for a boy to start a hobby—boys commonly give away other hobbies in a few weeks. Try to get all the old but serviceable parts you can store. Radio service shop will give you some old sets normally thrown on a rubbish-heap, provided you guarantee not to do them out of any business. You can assume any place handling electronic equipment has something to improve upon. Finally, if it is safe to genuine experimenters, buy it in a book and call it back if it is not properly used.

News jottings: The first VK6 registration of a Y.R.C. is the First Kalanusa Boy Scout Group—probably a transmitting type club with assistance from local Amateurs. Let us know about it—and stir up some others.

Auburn (N.S.W.) Senior Scout Group hopes to start a Y.R.C. to supplement Scout training, with assistance from the VK3AMQ.

We're proud of the scholastic prowess of our members—Commonwealth Scholarships to George Barnes, of Carlingford, and Vince O'Donnell, of Wahroonga (N.S.W.), sons of Tom VK3OD. There must be more, so let us know about them.

VK3EQ says Port Pirie Amateurs are forming a radio club and propose starting a Y.R.C. in the high school. Is there any help at Divisional level?

Barris VK4LN is starting a Y.R.C. in Gympie (Qld.) Boy Scout group.

Frank VK3HZ, who established the Y.R.C. at Arncliffe (N.S.W.) High School is now in Armidale and proposes repeating the pleasant experience in VK would be a great help. Don's new call sign is VK3DR.

rs, de Ken VK3KM.

CHOOSE THE BEST—IT COSTS NO MORE



FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

Jack Kast, F7AJK (home call WEMCB) gives the following details of the set-up at Addis Ababa. He will be there for 18 months and is using a quad 52 ft high. His QTH is 8,000 ft above sea level. His QTR for direct QSL is P.O. Box 1846, and if no direct reply is desired an L.R.C. may be enclosed. The QSL is 100% but via Bureau unless an I.R.C. is supplied. An alternate route is via KHQJ.

Recent changes in the A.R.R.L. Bureau set-up are: W.E.R. Ray Birren, WMEWB, P.O. Box 824, Elkhorn, I.L., 60115, Vice President, VE-218, 28 Belmont Rd., Downsville, Ontario.

Geo Barrett, 5B4IP, advises that the Cyprus QSL Bureau is located at P.O. Box 218, Famagusta, Cyprus.

The following Q.C. advised of the following new Awards W.A.T. for two-way communication with four of its members after 13th Aug. 1963. Certified list with 14 I.R.C. is required. Present members are APSCF, JA, AE, SS, 2P. Confirmed contacts were with Pakistan stations (since 13th Aug. 1963) located in West Pakistan and four members of T.A.R.C. in East Pakistan. Cert. list and 14 I.R.C. for this one. All mail to Mohd, APSCF, Dacca Signals, D-6, East Pakistan foundation which is the direct offshoot of the Yasse Foundation which is a non-profit corporation. The Yasse DK-pedition, now under way, A five dollar contribution, went to KVAA & WEEWSA who were excellent in their support. The weather was excellent in all 14 countries with a strain on Ken 2XK who was chief dispenser of liquids. The first event of the day was the 7 Mc. scramble and honours went to Harold ZAAH, Bill EXT and Alec 3ZM. The 14th event was the relay race won by Dick ZZCP with ZZPV second and Eddie 1VP from Canberra, third. The 7 Mc. fox hunt went to Harold ZAAH and Dave 2AW, second. Dave also won the 144 Mc. for hunt, while ZZMV was second and ZZPV third.

The biffle field to hunt proved very popular with the XYLs and harmonics, and the results were: Ladies, Mrs. ZACK; Gents, 2ALV; Girls, Ricky 1AQX; Boys, John Grouse. The mobile efficiency test was conducted to encourage mobile operators to improve the efficiency of their mobile equipment. Factors considered were: cost of equipment, ease of radiation, ease of operation on the move, neatness and road safety. Most points are allotted to road safety, i.e. the operator who can carry out a QSO on the move, keeping both hands on the wheel and not using the radio. The winners of this event were Harold ZAAH, 144 Mc.; and Keith ZZVL 144 Mc. Second placed for 7 Mc. went to Col ZACK, while Eddie 1VP took second prize for 144 Mc.

The V.H.F. and T.V. Group put on a good display of home-made equipment and another section was devoted to the latest commercial Ham equipment.

The Council wishes to thank all those who supported the Convention, especially the following trade houses: Duncan Concourse Ltd., Mullard Australia, Len Levenson, Hammar Electronics, Amalgamated Wireless Valve Co., E.M.I. Ltd., W.F.S. Electronic Supplies, and Town Talk Telco Ltd. 13, ZVL.

Speeches, not being popular at any dinner, were kept short, and a special dinner was extended to Len, Bill, WEMCB, and his wife, who, owing to the mishap with the Canberras, found himself stranded in Sydney just in time to attend the W.I.A. function. Len, in reply, spoke of his excellent welcome he had received extended to him by Hamo during his world tour especially ZL4, and his only regret was that he could only spend three days here.

The Newcastle boys were represented by Bill, 2ALV, and in the Bradford section by Alan, 2AKA, while Tim, 2ETM, led a group from the V.H.F. and T.V. section.

Noticed among the locals was the Ham family, Ted 2PC, XYL Heather 2HD, and daughter Margaret who, one ambition is to get a call of her own. She has heard Ted working a lot of Mc. mobiles because he can't get a go at the home rig.

The annual field day was held at the Dural transmitting station with an attendance of 300 adults and many more children. The weather was excellent in all 14 countries with a strain on Ken 2XK who was chief dispenser of liquids.

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BENTON BRANCH

Once again this month the w.h.f. boys are in the news with some remarkable breakthroughs on 50 Mc. Those participating in the increased activity caused by sporadic "E" and tropospheric tunnelling were Stuart ZAYF, Des ZZDN, Bill EXT, Jim ZZIF and Mac ZZMO. Jim and Mac had 144 Mc. for hunt in all States and ZL on 50 Mc. Mac had so many QSOs with VK4 stations that he personally went to that part of the world to hand out the QSL cards. Those contemplating activity on the 50 Mc. band are: Les, 2ZJG, and John ZZJG, Kev ZZKX and Fred ZZAP.

Conditions on 144 Mc. have also been good and Muriel ZAAJ has been heard at good strength in Newcastle. Those old gentlemen in 40 Mc. Bill and Bob have been getting some great crackling on 3 m as well. Ron ZAAJ would like to be an old gentleman on 40 as well but his box of tricks has developed some malady and he is active only on 144 as I write. Bill and Bob and Jim ZZC are still very active on 144 and the indications are that they are getting consistent signal reports from all over the Branch area. Rodney ZCN has been busy hiding his light under a bushel and though very busy on 80-25 is still managing to get contacts on 3 m and 40 as well to pass the T.S.O.C.P., which is really a commendable effort. If you would like to know what T.S.O.C.P. means, then see Rodney, but I can assure you there's no more test involved.

On Saturday night the Annual Dinner was held at Wireless Institute Centre where approx. 60 Hams and XYLs were welcomed by the President (Mr. IMP) and Council. The evening included a cocktail party and savouries, while everyone met everyone else and had a good razzmatazz, then at 8 p.m. Max took the chair and declared the dinner "on".

Ray Jones, VKRJ, Manager.

NEW SOUTH WALES

The Australias Day week-end was a very busy time for the N.S.W. Division, being the Annual Field Day and Convention. We started the ball rolling with the general meeting on Friday night when an attendance of approx. 100 people attended the "Modern Trends in Commercial Equipment". Ron had some very nice commercial sideband rx's on display but his lecture, illustrated by slides, was most interesting because he gave the reasons for technical and commercial why certain commercial firms incorporate ideas and circuits in their design and discussed the advantages and disadvantages of mechanical filters and crystal filters for sideband operation. The sideband boys learned a lot while the "ancient modulation" boys realised that they had a lot to learn.

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the cage round the ladder is only made for a 6-inch width, so perhaps he'll have to get me to take up the antenna.

Bill 2EXT and Ernie 2PF, with Ernie's XYL, are at present on a jaunt all about the place with the mobile gear. First port of call is to be the Gold Coast, then Port Lincoln and via VK5 and VK3 to VEL and then horns Out in the Charlestons mulga it is interesting to note that since the acquisition of the AMR-300 nothing has been heard on Norm ZZNF 144 Mc. in the last few months. The result is as me; so much on the bench that there's no room to work. Ron ZAAJ about whom we hear occasionally, is shortly to be active on 144 Mc. s.s.b. where he will be a competitor for Jim ZAAH, the loud voice from the south lands. Jim is now Jim, recuperating a bit in the hospital, but it is expected that by the time these notes appear he will be back on the air.

The latest activity out in the smoky zone of Maranoa is the new band by 2EP, 144 Mc. of course, after he had groped his way out to the shack through the mobile talcum powder so generously supplied by the steel and smoke works. Bill Sinclair, who still waits for the call he has had for 144 Mc. has built and erected a 6 over 6 dipole slot for 2 Gordon ZZSG. 2GSG has completed the seven-year project which was a four channel audio mixer—that's nearly half a channel a year. Dave ZZEE now works full time so we'll probably never hear him outside of public functions in the cosy city Peter ZAYL has just completed his holiday, with 80W. on 144. The biggest Indian, Chris SPZ must really have been serious about the Mercedes Benz, because it has arrived complete from Tasmania. Sharrow's mud-motor troubles have all disappeared in a puff of smoke—so to speak. You just ask him. On the associate front, Ross Beckley has a new rx which must be a good one because when on 80 Mc. he heard Bob has a strange grey box. I am told and am able to identify it. It may carry it away. The Marmon mob still play loud music at all hours and one, who is not even a member, borrows Dennis' "A.R." just to read these.

And that's the round-up for another month. What about visiting the old firm next meeting? We'll all be there at the University College, Tighes Hill, on Friday 8th March at 8 p.m. Many say "there's going to be an exciting night so why not come and heckle with the rest? And don't forget our broadcast, Monday night, 8.55 at 7 o'clock—you'll hear all the latest gossip. See you both places, 13, ZXK.

THE BLUE MOUNTAINS SECTION

The monthly meetings have been well attended and the lectures have been by Les ZZB and Aris Blasz on transistors and side-band equipment.

The Annual Dinner, held at Atchison St. was represented by ZTAD, ZZNS and ZADA. The evening was most enjoyable and Don LART received second prize in a U-tac-dough competition. The following day the Annual Convention was held at Dural and four members from the club, namely, ZQA, ZZNS, ZZPF and ZADA, operated the blind fold tx hunt for the Division.

Bill ZZS is getting spliced on 3rd of this month, so our best wishes are extended to

N.S.W. DIVISION, W.L.A. NTH. COAST & TABLELANDS

ZONE CONVENTION

will be held at

URUNGA

during Easter Week-End

12th to 15th APRIL, 1963

144 Mc. to hunt, 144 Mc. to hunt, all band scrabble, general entertainment. Accommodation of all types available on application to Mr. J. Walters, C/o Ocean View Hotel, Urunga.

Bill and his YL. Bill has been heard operating from his new QTH at Orange at good strength. Due to the recent heavy rain he has had to return to the house for the winter and should be back on 2 mhz very soon. Jack ZNC is on every night on 1 mhz after fixing up his aerial change-over relay and listens via his converter through a newly acquired rx with all the mod cons, etc.

A tape night was held at yours truly's and six members heard two tapes plus slides, namely Quad and V.H.F. Antennae, and it was most interesting. Below is a copy of the notes ZADY answered one of Noel's (ZZNNS) many QSOs in the early stages of his operating and was at the time his furthest report from the west. Also Noel and Norm QXA have been working 2 mhz duplex with no problems. Jack ZADY has been getting mixed up with Noel on 2 mhz duplex also.

Wal MZM and Ken ZAVN are still busy with the bush fire show, but it looks like the real danger period is over. Yours truly has made a mod. to the 7 Mhz. mobile so that we now have a r.f. audio switch mounted on such and some r.f. The ZAVN radio is back on 3 mhz with new gear and is coming through loud and clear. A new heap which I have not reported was obtained by Noel ZADY and is of the self tuning variety. It should be a lot more of Bob mobiling the countryside.

The Feb. lecture was by yours truly and dealt with electronic business equipment including slides. T.S. ZADA.

VICTORIA

WESTERN ZONE

Activity in the Zone has not been very great, but should improve with the passing of the harsh winter months and hot weather. Bill SAKW has an alternator in action and his gear is now running from a car supply. Wilson ZAFU has his mobile rig going nicely and his signals have been heard from various parts of the State. He has been doing a great deal of work to make himself heard on the 3 mhz band. Bert ZEF has been in strife with both rx and tx. He now has both tamed and is operating on 30 and 50 mhz. His first call was 100 ms and resulted in a QSO with ZPAP. Now work! Kelvin SAKH has been busy with tx, but one of these days will blow the cobwebs out of his gear and come on the hook-up. Alan SHL has been working fairly regularly on 3 mhz and a few other bands.

At Scarsdale W2CC will be on VK in April and will be staying with Allan at Callawadda for a week. W2CC and VKNRH have been in contact since 1954 and will maintain weekly checks on the mhz bands. Al hopes to do as many of the logging as possible during his stay in this country. Bill SAKW has been enjoying a visit from his brother, Tom ZFK. Tom is an "old timer" and operated as STK around 1930. T.S. ZHL.

During January JACK tried his hand at making balloons for 2 mhz. It may be recalled that a few years ago he assembled an electronic organ kit, nowadays he spends a little time learning how to use the unit.

After months of waiting, ZAPF finally obtained a vidicon tube and was thus able to finish off a caged circuit. This project has circuit work as per specification and has now been "junked". Understand ZAPF still plodding along on 3 mhz exciter. Yarrawonga Club not heard too well here, nor very often for that matter. ZCJ has erected a antenna on his home 20 ft. tower. Late in Dec. SAYD had to pull down the triband quad to carry out repairs. Lesson learned here is not to use single strand wire as strainers or elements. ZAPF currently portable near Ballarat occasionally visits into the Zone hook-up on Friday nights on 50 mhz.

IACD has constructed a "Mondomatch" and early in Feb. was learning how to adjust it. ZAPF and cohort ZMO, are contemplating trying out modified light transmitters, however gear has still to be assembled and this is the killer. Z2JH ceased morse practice prior to Xmas and finds it difficult to start again. ZASY flung out one of the two sets of final and intends to be satisfied with single

50'. Took a portable fm to Scout Coronation at Holart in Dec., however the location was unsuitable for propagation, only made four contacts.

Shepparton chaps have been busy on plans for the State Convention, to be held there on March 16 and 17. For heavens sake please give us a fair go and get your applications in early to the appropriate quarter. T.S. ZASY.

MIDLAND ZONE

The festive season is over and by all appearances so is all activity within the Zone almost. This month we have not heard much from the Zone generally, but there is little to report as to members' activities.

Ian ZAUQ is active on 20 mhz, working some DX, but like myself finding the band very patchy. There has been some short skip operation and a short band skip pattern intermittently to England in the short paths in the evenings. 10 and 15 mhz are a dead loss at the moment. 40 mhz is patchy and noisy and the stations working this band stay in their groups and I find it impossible to attract their attention with my 10 w. input.

By the time these notes are in print we will have had our quarterly meeting, which will have been held at Maldon. Our best for the evening will be ZL2ZL Ian Goroch. That's about all I can say at present, but I hope to help keep these notes alive with news of your doings. T.S. ZND.

VICTORIAN DIVISION, W.I.A. STATE CONVENTION 16th & 17th March, '63 at Shepparton Premier Town of Victoria

★
Highlights: Buffet Dinner, Visits to Radio and T.V. Stations, Comptions to Tx Hunt, Commercial gear.

★
Accommodation: 3 motels, 5 hotels and 2 caravan parks.

★
Bookings: Dinner and Accommodation, £2/12/6 per person; Dinner only, £1/12/6 per person.

★
All bookings must be in by 2/3/63 to Box 205, Shepparton, Vic.

QUEENSLAND

Who was the character that said, "If you put your neck out long enough, and often enough, it will eventually get bitten"? Well, it happened to me. I have been elected or nominated or something, into being the Sub-Editor for the Sunshine State. Well, it was sunshine when I left for Brisbane, I'm not sure whether it's been rain or sun, but I've got quite a lot of fun out of writing these notes and keeping you posted on the doings of the W.I.A. and of various Hams. And if I can't get any news, I'll invent some, so keep me posted, as I've very wild imagination, and would hate fans to get the wrong idea about us strapping, well built, Queenslanders. All this of course, pre-supposes that someone pinches the Editor's pen pencil. (Like I am, Ed.) Now just a second, what's on my eyeshade and make like a Sub-Ed?

The Jan. general meeting was held at the State Service Union Rooms on Friday 25th and was very well attended by over 60 members. All signs of the winter were evident.

The other eight were probably spilt between Southern and South Western States, checking on how a well conducted meeting can be had. Pat 4KB was in the chair and business centred around the article in "QRCA" on the Divisional Constitution. If any member is not clear on the article, please write to Box 635, Brisbane, and he will be put right.

The important business of the evening was the 4GPT talk on "Television," and how Don Watson had projected it. He really put all interest into it and drew his audience with him for two hours.

Have you any notices of motion for the Annual General Meeting in April? If so, get them down to Box 635.

The Ipswich and District Radio Club had a good attendance of 25 members at its Jan. meeting, which was held at the 2nd Ipswich Scouts Hall. A.O.C.P. classes have been started with a qualified teacher in charge, and Ron ARG is looking for a mentor and mentor. 4ZGM has been elected as assistant sub-editor to help me with these notes and I am very pleased indeed to have him, because Merv, old boy, I'm going to lay the blame at your feet for any notes that ye Ed. may disagree with.

My young son asked me to check his homework the other night and one of the words he had to break down was Auditorium. He repeated the word came from the root word I hear, and Taunts the word. "What?" I said, "that sort of definition went out a long time ago, although I do believe it is still used in South Australia."

A friend returned from three weeks at the seaside and then worked some rare Middle East DX that had accumulated on his serial in his absence. His only complaint, re his holidays, was that shorts weren't made for humans, he's a good fisherman who's not human. He only looks like a worm. What you want shorts for? Bare feet are just the shot for luring unsuspecting sandworms to the surface, unless of course, you are ticklish. Some people can be hurtful. Bill ZEDM, who is the "Prisoner Dind" for QRCA, turned up his stocking for Santa Claus and you would believe it, but he got a new rx. I'm led to believe that Bill never did like the blonde

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Frequency Range: 400 Kc. to 250 Mc. in eight overlapping ranges. **Cores:** Precision factory wound on polystyrene formers; coils are specially treated to prevent the windings from moving if accidentally knocked, etc. **Meier Movement:** 500 microamperes. **Frequency Indication:** is by means of a rotating drum (housed inside the case) with 340° rotation; scale length is 3½" long. **Circuit Type:** Colpitts type oscillator with improved grid current stability over the tuning range. **Tuning:** Tuning condenser is equipped with a 1:7 ratio planetary drive. **Power Supply:** Self contained transformer operated selenium rectifier. **Dimensions:** 2½" high, 2" wide, 6½" long.

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member of the Andrew Sisters, and he is pleased to tell all and sundry that he can tune her out. Some set!

Bob Campbell and Ray Rumble, previously of the W.I.A. Radio Club have offered to organize the 1962 Convention, to be held at Alexandra Headlands on the 29th, 30th and 31st March. It is right on the beach, no cooking, no washing up, and plenty of room. Bring a whole bunch of friends and have good time. It's a whole new opportunity so make your fellas Hams and also get your VKL interested. The cost of the Convention will probably be less this year. And talking about costs, don't forget you can get a discount if you pay in advance. The place concerned with the bookings quite a lot of work if they are paid promptly, not to mention that your "A.R." continuity will not be broken.

The very good job of public relations was performed on 29th and 30th Jan. by 4ZKL, 4ZAK and 4ZKX who provided communications between check points for the Mt. Bruce Scout Group who were on a hike, passing through Mogill Ferry and College Crossing. Don't forget fellow, when you co-operate with the Scouts, you are the ones that let Scout HQ know "Scout Shop, Broadway, Brisbane" it could be printed in their magazine, "The Scout" with benefit to them and to us. (Being a Scout Master, I must get in a plug some where).

The traffic police in Brisbane don't take a very kind view of horse and buggy transport, so I had to unarness Cyril (my horse) and ride him solo in order to get around. Bit of a bother trying to work mobile though. My workshop is all the way down to the river to Brisbane about my mobile, I can't see why. It worked well, all she had to do was sit in the rear of the buggy and work the pedal wireless. It's a good wireless too, all that I have experienced. So I am going to do the same that unless I get a better rig for next holidays, I'll be replacing the YF. Never heard of a valve with those letters!

I visited All 4OL, who is doing a mighty job when running 4WU. It seems to be an easy job when you have to go to his house to get gear from your shack, but he is doing it under difficulties. Due to his work, he cannot, at any time, attend a W.I.A. meeting, so has to depend on others for news, etc. And the members of the club are getting fed up with him about keeping him posted with some news via letter, instead of doing it over the air, unless of course it is last minute news.

Noel Lynch with other Scouting, took some of the V.H.F. Group to Nerang on 3rd Feb. to look over the proposed route, for which the V.H.F. Group, with a 4G to mix link, will be doing the communications.

Bob 4RW is on the walkabout again. This time he is heading for Tasmania. Won't be back until Easter. How do these blokes get all these holidays? Well, I am home now after three weeks holiday. What do I mean? Head about Stan 4SA and his fishing trips. He went out fishing and caught only catfish. Most good fishermen take a knobkerrie along to deal with these menaces, but Stan has them to go with his pocket knife. Now do you put up with him? Just! I believe All 4OL and Stan 4SA declared a truce whilst I was in Brisbane. It seems as if they cannot agree as to who can talk intelligently for the greatest length of time. Or for that matter, just talk.

Jim 4HZ is still in trouble with the modern bogey t.v.l., but he has hopes of getting it fixed in the near future. Jim's XYL, Nell, has been in hospital seriously ill and is now back home. When you get home, give Jim 4HZ and recover your usual cheery outlook.

Hal 4DO is going overseas on holidays. (Again, see!) How do they do it? He is leaving on 5th April and judging by his itinerary whilst eavesdropping on him, it's going to be some holiday. Some of the members of the Burdekin Radio Club have taken up flying and are doing quite well at it. Associate member Harold Cisak is flying solo and is only waiting for his 40 hours to come up. Dale 4ZDG is another who has quite a bit of flying and is also chasing t.v.l. or was, but as he is going on holidays (that word again!) during Easter, he is building v.h.f. gear to take with him. Ever listen to Bob 4NG and Bill 4WD on a Sunday morning? You can pick up some good gen on the behaviour of 8 m.s.m. from listening to them.

W.I.A. LOG BOOKS

5/6 plus postage

Took Cyril for a gentle trot one night in Brisbane, and ended up at Salisbury; going along Dulcie St. Cyril suddenly shied and I realized that the object he had shied at was a large tree trunk. A close look, however, discovered it wasn't Telstar. It was Ron's (4ZK) Morris utility, bristling with aerials. Fair dinkum, I've never seen so much gear packed in such a small area. On the front bumper is a 12 ft. whip for 40 meters, the top of the mast is another for 6 and 2 m.s.m. In the cab is a Compus ra. converter for 40, 8 and 2 m.s.m. tx's for each of these bands, and under the bonnet is the power supplies. And what this beastie had in the back three people in the cab. Then the cap it all, he showed me the latest thing in crash helmets. Built-in transceiver and serial, the whole works. Too complicated, I'll stick to my pedal wireless! I could not resist go down on my gear, but I'm afraid I will limit my verbiage to the only excuse I have to offer is that over 25 years ago I was scriber for VK4, so "give us a go will you?"

Very nice, cheery bloke I met was Les 4ZL who is not a small man by any means. Theyoughly enjoyed my visit with you Les. His VKL makes a good cuppa, too.

Remember "Doc" Hadley, you old timers? Well "Doc" has staged a comeback. His old call sign was 4AH and its present holder has a mighty predecessor to live up to. "Doc's" present call sign is 4HY. 72, Uncle Xray.

TOWNSVILLE AND DISTRICT

Basil 4ZW called in on his return from his overland trip south and as usual visited us. Basil is the owner of the Shire River district and comes from the fruit he consumed direct from the trees. Ted 4LJ at long last has built a new shack and the boys in VK3 are hard at work to get gear as per the colour photo and not mentioned. However, the old junk has been given the go-by and at present is making in-built cupboards to keep the place clean and tidy! Bert 4LB is highly satisfied with his new shack and guarantees to outfit up no better. Bert 4LB has a wife and calls the other night on the band, and quite a long-time no hear him. Bob 4MF is still chasing better gear to end gear and at present using American rx; hope to go on a long tour America in the near future.

John 4DC is still on the band and heard in QSO with the States. Claude 4UX and family have returned from a holiday trip to the big smoke. Ere these notes appear I will be calling on the Editor to make a personal complaint why I have received a sum due to my salary since last year as that favoured scribe No names, please. This time I will have left on 4th Feb for a trip as far south as Hobart and hope the weather treats me kindly as at present the weather is not too good.

Pleased to know that Eddie 4OW has returned from Darwin to Brisbane and can be relied upon to come on the air each Sunday when shift work allows.

Why oh why cannot those chaps who come on the air "testing, testing," please give their call signs (besides breaking the regulations). They will get a report on their testing if only because I shall be doing it often. I often QRL the testing station and will be happy to give them a very candid report. So what about it chaps, if you want to test, there are many others roaming the band like myself who would be only too pleased to assist. That is the basis of the Amateur Spirit.

Will prevail on Claude to write the notes while I am away on leave, as cheario, 4HW.

SOUTH AUSTRALIA

The monthly general meeting for Jan. of the VK5 Division was held in the new club room to a very representative gathering of members and visitors, and the guest speaker was Mr. C. Pearson (NIV), who discussed transistors and their applications. A most little can be said on the technical side of this lecture because practically the whole subject itself is to the blackboard, and as the VK5 Council is still persisting in its attitude of non-membership, I will not let the blackboard go away to the magazine, it goes without saying that my comment must be limited to the personal reactions of the members present. Clive missed his theory with a little humour, and a good deal of criticism on the technical side, and a great deal of practical advice. All in all, Clive should be more than satisfied with the reaction to his lecture and his audience definitely richer in transistor theory and application. I would like to thank Clive for his permission to quote his lecture and Clive came through with flying colours, further demonstrating his knowledge and competence in the subject. Tony 3BV was responsible for the organisation of the lecture and the chairman who greeted the vote of thanks was sufficient indication of the splendid job performed by Clive. Incidentally, Tony made a suggestion that perhaps Clive would comment on the near future of the local market on the basis of transistors and whilst Clive did not comment, the members' reaction to this suggestion should do the trick.

Very little business of note came up for discussion, although the suggestion that VK5 should be invited to send a delegation to the coming Adelaide Festival of Arts (approx. one year hence) caused quite a deal of discussion and the matter was put forward for a motion to check on the general membership reaction to the idea. The motion was carried at once (compulsory now in the new clubrooms) and members departed for their couches of virtuous or otherwise, well pleased with the night's entertainment, and more than pleased with the facilities and general facilities of the new clubrooms. Come along some time and see for yourselves.

Among the visitors to the monthly meeting was two VK3s. Keith MV from Ballarat and

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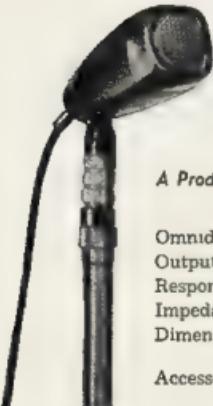


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Col XIV from Oakleigh. I had quite a chat with these two gentlemen and despite the fact that they were very busy, took time to give them extra good seats! Col is a brother of Maurice Anderson (ex SMA) of Cheltenham, but probably better known from his association with Al Fraser and the Flying Doctor Service. Maurice was on tour on course but was always an ambassador for VK5, and a good representative to boot.

Rob SMC is back in the R.I.'s department after a sojourn at W.R.E. Rob has certainly been around the world and someone should have accumulated a goodly store of knowledge in all matters radio. Always willing and eager to help in any way, he would make a good council member and someone should begin twisting his arm in that direction.

Ahol SLR noticed a disturbance below the right eye which led me to ask him if the verandah post had eventually fallen down. He did not seem to be very anxious to answer my kind enquiry, but finally broke down and admitted that the conversation had been overheard. Could he possibly have been having a lend of me?

Noticed our estimable chairman, John SJC, anxiously glancing across the room several times during the lecture and at times wearing a frown upon his aristocratic looking brow. With this added to his hearing, I thought it would be well to remind him of one from one of those present, who apparently knew more about transistors than did the lecturer and was not interested enough in the subject. Next night, when old ears must have been freighted on the job. Next time I answer you back I'll have to whisper.

Talking of mumbling during the lecture, I noticed two of those present having a good old yap to each other using the deaf and dumb sign language. It's long time since I heard such language myself, and am somewhat rusty now, but if I understood correctly, then I feel that I have missed something in my sojourn on this earth!!

John SJO had been scuttling hither and thither around the VK5 countrywide over the Xmas break and if I can be believed, has been working stations galore on his portable set-up. The list of stations he has contacted looks like the Who's Who of Amateur Radio. And when that information has been gleaned on his trip would qualify him for a job on my espionage staff any day he wants one. The salary?—Oh a couple of those sought that Ye Ed. throws around will get him abashed end each other.

Eric SVM and family have been over in VK5 for one of their periods, visiting of course, have been seen in the company of Jim SFO and his family. This friendship was formed many years ago on the air by the two families four hour QSOs, etc.) and has continued through the years. Eric's Xmas Lorie can claim the distinction of being an ex VK5, she is the sister of Len (ex SVM) from Crystal Brook way, who incidentally, if my spy can be trusted, is on the way back to the air. Good news, Len, the more the merrier!

Received the usual seasonal letter from Arch SKX, that refugee from Norfolk and Lord Howe Islands. He tells me that the notoriety handed out to him after the D.P.A. trials had been enormous and in the same breath tells me that it has not changed him from the quiet unassuming ambassador for c.w. that he has always been! Quiet and unassuming, it is a wonder his typewriter didn't collapse under the weight of his words. Nevertheless, I will grant him the title of ambassador for c.w., he has done more for c.w. in VK5 than any three a.s.b. converts put together, and seriously, who would want to pit three a.s.b. converts together? Don't answer that.

Ken SIM reported as passing through Lincoln over the Xmas period, as was Howard XXA, and as yet, as far as reported seeing some Norfolk Island natives with their noses, although they did report a Lord Howe Island native with a nose through his bone!

Rumour has it that John SJW has been here on ? M.W. with some strong c.w. backs. If this is true, we welcome him back with open arms after such a long absence.

Vic 5JH also heard from Nhill at times over Xmas, although at the time he heard he was camping in his car in pouring rain, his spirit was high and his heart full of fun.

Bob SBD still recovering from the effects of the before-mentioned wind which nearly uprooted VK5 recently. He lost all of his aerials, beams, etc. but it will take more than this to keep a good man down. What say Bob?

Unless my ears have let me down badly, that was the voice of Harold Scott that I heard under the call sign of SJO in the vicinity of Currency Creek. Have not seen you since Joe's wedding, Hartford. Keeping

well? Dave SDS, my favourite Scotchman, still in the pink, even though he throws New Zealand trout at midnight and carry on until the wee small hours of the morning. Such frivility.

Reports are still filtering through of breaking and entering of shacks, and once again opportunity is taken to warn all these of the gang who like nothing better than to break into your shack and keep it better still. Fix up some alarm system and possibly catch this persistent offender. He is pretty shrewd, he knows his mark and only takes what he wants, or he scares the fellows.

Time of shame. I heard a beauty the other day from the shack of Jack SZN. He was in QSO with Lionel SLB and every now and then there would be a bang come over the air that would have done justice to a royal salute. I stuck around long enough to find out the source of the noise. In Jack's shack is a big tin with a couple of loose funnels on top of it, and every now and then it contracts or expands and everything in the shack, including Jack, jumps up in the air screaming. Now, if it scares Jack and he is half a wake up to it, to what would it do to a would-be burglar?

By the way, I see that Jack has been wrongly blamed in these notes for the past few months. I don't believe him guilty of SLM. I thought he acted cool toward me at a couple of meetings and decided to find out why. Now I am sure that I could not have made the mistake. I am equally sure that the Editor was not the blushing son of a gun. The person of unwanted chassis would be likely to accept the blame, so once again, I will have to be the martyr. It puzzles me. I may not be always right, but I am never wrong! (Two Whites don't make a Wong Ed.)

Paul SWI has been getting us down to trifle lately. Reception conditions have not been the best on this band and last Sunday, to make matters worse, there was no 80 mrx re-broadcast available. One good thing, all of us no reception time on the bands, makes everyone appreciate the valiant efforts of those responsible and these fellows certainly deserve some appreciation. I have been tempted to forget to write these notes for the month, but the world will appreciate it. I would get Only the thoughts of the cheerleaders and other expressions of joy and happiness from all concerned deters me.

Geoff SZQQ is now the VK5 Federal Councillor, and will represent us at the coming Convention in Sydney. He replaces Phil SNN who was elected in December last year, and of course will be the new Divisional President as this is being read, I hope.

This month will also see a new Council being voted for and my spies are hinting at a surprising number of changes. Well, all the good, as without a live Council, the Division won't get very far and new, enthusiastic and keen members are always wanted.

Just when I was getting all enthusiastic and handing out bouquets to VK5 on their art and quantity of their Divisional notes, what a shock! Apparently out of the blue, easy and shyness at all the praise being handed out, the scribe took off on the padre's bike. Come out, come out, wherever you are, you can't mean it personally. How's that? Feel any better?

Radio funny. Joe SJM made up a portable rig for the Brompton Boys' Club and left it with him on his aforementioned trip round VK5. He was a bit of a P.M.G. at the start of the year and tells me that he intends to enjoy life and relax in the sun. He has not had the best of health for some time now, and I can't say I blame him for giving the game up. To be fair, I am quite jealous.

Good luck to you OM. Heard Geoff or Jeff ZAHM in contact with Ken SIM the other evening and believe it or not, Ken was taking credit for the radio that had been selling all around VK5 and was apparently Wentworth. It appears that on the Xmas card he had received from the ZAHM family were written the words "Please send us some rain for Xmas", and because about seven of us had fallen for them, Ken was sitting back and endeavouring to take all the credit.

Managed to get on to the tail end of a QSO between Frank SMZ and Carl SSS and gathered that Carl had a few days ago been chasing sheep for a few days. Couldn't manage to get any more details, but sincerely hope that Carl will remember to wear a hat all the time, just to make sure that the drovers know who are the sheep:

Cec. SBZ heard on 7 Mc. for a short period the other night, very short in fact, and whether he was able to identify the QSO from the side, I will never know. Rumour has it that he is preparing to see the country on an extended European tour. Want someone to carry your bags, Sir?

I suggested to worthy President (John SJC) that it would be a good idea if the Divisional frequency meter, at present in my custody, should be held by the operator of SWS (Clive). Frequency checks, if required, have been carried out by Brian SPC, and if they agree to this idea, then Clive always tools a QO on the horn as he goes past."

Les SNS going great guns portable from Port Elliot and put out a remarkable signal with the low power at his disposal.

I notice with a sense of misgiving, the increasing tendency on the part of some contributors to this magazine to belittle the art of a.s.b. sham, and feel that apparently they are working on the assumption that something new must automatically be inferior to the existing art of telephony. In an endeavour to stamp out this state of wrongful thinking about a.s.b. I would like to point out that I have just read in today's *Telegraph* a technical book published around 1928 and on page 58 I read with some surprise, I quote,

"In March 26th, 1928, commercial two-way radio telephone conversation was carried on between London and England, and the type of transmitter used was a simple single side-band eliminated-carrier transmitter." Well? What about that? Something new eh? Anything that old must be good. Look at me. No more disparaging remarks about duct talk please. Consider the value of these v.h.f. notes, so I could not possibly be upset about anybody advocating a.s.b. Gercha.

When I was a member of Council we used to sit up and biscuits at the end of the Council meeting and then sit down decorously depart for home. Just as they tip their hats, I would not know, but my son, who is planted right in the middle of Council, tells me that the Elizabeth representative on the Council, Tubby SNO, left the lights on his car burning brightly in the dark outside, and the car had to be pushed down the road by the entire Council, and as far as is known arrived home safely. The chairman (John SJC) went one better, he managed to get completely lost and arrived home in the early hours of the morning, crept in the back door and retired for his beauty sleep. Next morning the family rose early to go to town for some shoe buying, only to find the lights on the ear burning brightly and the bats flying all around. A quick veil over the domestic scene which followed, but this I can say with freedom, the chairman of the VK5 Division was ruled out of order early in the piece and that lump on the top of his head was well deserved. The Informer boughs him one when he rose on a point of order! It never even marked the gavel.

It would appear that my lone fight for the payment of our licence renewal at any post office is at last paying dividends. Leith SLC informed me at the meeting, with an unmistakable sneer in his voice, that his wife had paid his licence fee that day at the Edwardstown Post Office, and the joker never said, "Boo. Well, we will see, I must try up and pay mine next month". Place your order now, next month, I might add, and read either about the victory or the defeat.

Received thousands and thousands, well, hundreds and hundreds; well, tens and tens; oh have it your own way, several letters over Xmas referring to my humble efforts in this matter. I am not particularly pleased at being mentioned in this manner, but I am not saying more, but thanks a lot, I enjoy doing it too, it feeds my ego! I even received a telegram from Max SARZ saying, "Merry Xmas. Paid local office again." How cruel can they be? Is it a.s.b. Fancys to you.

TASMANIA

The v.h.f. bands have really hit the headlines in January. It all began when David TZAI and Reg IZAO worked a VK3 on 2 m. A little later, Len TBQ was worked in Hobart, to be followed by 14 VK3 contacts made from

Hobart by Winston ZWH, formerly ZAB, who will again be resident in Hobart I believe. This will go to show that populating these bands can provide some most unexpected results. It is also good to learn that ZEC from Evansdale, is able to get through to Hobart nightly on 3 m.w.

The W.P.R. has erected a 50kW antenna and is now trying it out on all bands, after one or two teething troubles. The v.h.f. gang have now received their crystals to land them on 144.1 Mc. and the chin-sagging of the 144.1 Mc. band at the same frequency must be heard to be believed.

Remember the Annual Dinner and General Meeting of the Institute. The date to keep available is Saturday, 2nd March. Bring your XYL, girl friend or mother along, and make it the annual winter social event.

Remember, too, the elections for the new Council. If you are a full member, be sure to vote so that the Council of your choice directs our Division's affairs.

At our Feb. meeting, John Z2OO delivered a very interesting lecture on pulse modulation, which included those present that such a form of modulation on v.h.f. had many points to recommend it, despite the width of the signal. It was very good to see one of our newer members delivering the lecture so ably.

Amongst the new members elected at this meeting was Cros. YCW, or should I say, re-elected. We welcome you back to the fold and hope to see you along often, as well as on the air, in the future. Michael LEAV has started his mobile 2 m gear in his recently acquired car and is having lots of fun running his battery down at regularly short intervals. Geoff ZAB is back at work and feeling and looking a lot better after his recent illness.

Our next Federal Convention will soon be upon us and our Feb. meeting passed several items to be included in the Agenda. It was first class to have two items brought forward by the members. ZAB and I hope for further examples from the other Zones of interest and activity such as this.

Conditions on the lower frequencies have been variable during Jan. I personally worked a dozen or so on 80 m. during the month on 3.5 Mc., as well as VFO JAR on 160 m. On other occasions the same band was virtually dead with considerable QRN present. ZA, YZ.

NORTH WESTERN ZONE

Terribly sorry for missing the last edition, but an honest mistake was made regarding the publication of my article.

The first meeting of the year was held on Tuesday 5th, and a good attendance was present. Many old faces, such as YTT were there and we were pleased to welcome visitors, Bruce Barron, Alan Greenaway and Miss Russell. Much business was discussed, including suggested items for the Federal Council agenda, and a future TX hunt, a possible date being 10th March. The controversial letter seems to have been sent to relevant people. All in all a sensible result and much has been achieved by it.

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The meeting was followed by a fine color slide show by courtesy of 7EF and YMK. Max, having recently returned from VK3 and VK5, favored us with many colorful mainland shots.

Rumours has it that TMS will soon be rejoining his quiet quiet life in the U.S.A. Unfortunately no more news is available. David seemed in uncommon good humour Tuesday night, although he did seem to be suffering from that now-common ailment, the square-eye disease. And YMK had recently acquired a phased-array antenna and not on 2 m.w. Some v.h.f. is coming through from VK3 and beyond, and 7AI seems to be doing fine DX with his "duck-balker". Athol, although officially cleared by the R.A.F. has been briefly accounted for. The TV Committee have the matter in hand and will no doubt clear the matter up. Sif 7EF has a nice black box of auto-tuner tricks. No doubt we will soon hear this competition-winner on the air. Keep at the studies, Bill, and good luck. The next exam, I think, is in April. ZA, YZB.

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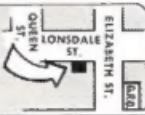
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